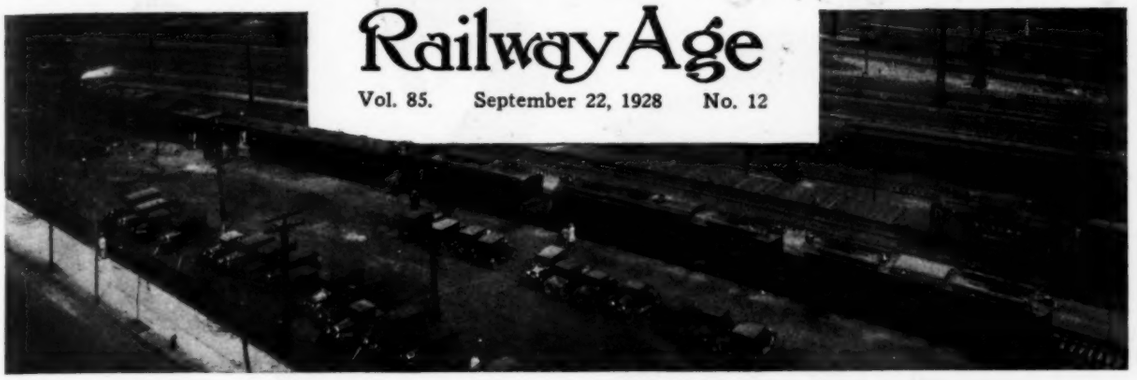
Railway Age

Vol. 85. September 22, 1928 No. 12



Track Exhibit at N. Y., N. H. & H. Yards, New Haven, Conn., at Recent A. I. E. E. Meeting

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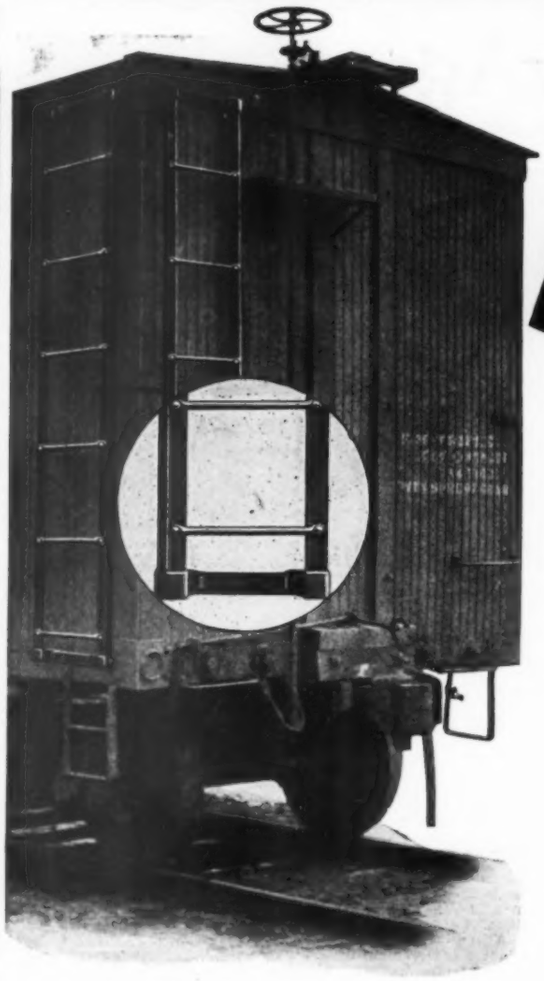

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Railway Age

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Louisville & Nashville Pension Plan

ON another page will be found a letter from G. E. Evans, executive vice-president of the Louisville & Nashville, directing attention to the fact that the *Railway Age* was under a misapprehension when it published the editorial entitled, "Unique Pension Plan," in its issue of September 1. The comment in question was prepared on the basis of a statement in the form of a series of questions and answers signed by the executive pension committee of the Louisville & Nashville Veterans' Club, outlining the proposed pension plan. We assumed that the plan, as described, would require liberal financial contributions from the railroad company. Moreover, the wording of some of the questions and statements seemed to indicate that the railroad company was a party to the transaction, although this was not specifically stated. We greatly regret that because of these misunderstandings we characterized the plan as both contributory and contractual. As clearly indicated by Mr. Evans, the railroad company will not participate, if the proposal is adopted, other than to agree to make stoppages on the payroll for the benefit of the plan.

Do Costs Measure Performance?

WHAT indexes should be used to gage performance? In certain industries cost finding and cost accounting systems serve this purpose, but is a monetary figure the only gage that can be used effectively? The monetary measure is important in an industry which is unregulated and may thus refuse business which is unprofitable. It is doubly important in such an industry if its product is such that unit costs can be definitely assigned, rather than merely guessed at by the application of an arbitrary factor. But what about the railroad—where any division between commodities or shipments would have to depend entirely on arbitrary assignments? And where no control over the volume or nature of traffic exists and where charges are pre-determined? The reasons that railroads do not follow each pound of freight through with a check on costs, as some industries do their product, are two: First, accurate information cannot be obtained; and, second, because even if the information were obtained, it could not be utilized as a basis for refusing non-paying traffic. Still it is possible in the railroad business for the management to exercise control—only that it uses other indexes than unit production costs. Unit costs are developed locally, of course, for certain *operations*—but even here other indexes may be used, such as (in the car department) okays per man-hour or (on the road) gross ton-miles per train-hour, and so on. The supervisory officer knows very well what is expected of him in all these various ratios. He knows what par is and that he will have to explain any failure to attain it. Conditions being what they are, existing methods give the railroads relatively the same degree of control over controllable factors as the most modern costing systems do in outside industries.

The Passenger Traffic Officers' Opportunity for Service

THE passenger traffic officers, who will hold their annual convention in Colorado Springs next week, have one of the most serious of railroad problems in their department. As pointed out in the *Railway Age* of August 11, page 249, railroad revenues are now averaging $800,000,000 less than they would have been if passenger traffic, instead of declining, had continued to increase at the same rate which it maintained prior to 1920. Great losses have already been sustained and the immediate future does not promise an end to the problem. The railroads have not yet been able to stem the tide of the shift of passenger business to the highway. The highway motor coach, without any regulation in interstate service, is venturing beyond its acknowledged field of short-distance transportation and into that of the long haul. An article in the Motor Transport Section which appears with this issue of the *Railway Age,* describes a carefully designed highway vehicle which provides sleeping and dining facilities for 26 passengers. The airplane, while not yet an important competitor, promises to become so. On page 541 of this issue appears an article prepared by an independent investigator, proposing that the railroads combine to form an air transport company. What will the solution be? How much passenger business can the railroads expect ultimately to hold on the rails? If a large proportion of this traffic has permanently left the railways, how are they to reduce their services and expenses proportionately? Are the gross revenues from the business lost to highway and air competitors sufficiently important to make it advisable for the railways themselves to enlarge their activities to include the operation of other methods of transportation? The railroads will be brought closer to satisfactory answers to these important questions, if they are given thorough discussion by the passenger traffic officers at their convention. Railroad opinion needs to be unified to a point where it can assume the offensive in meeting the problem of competition by other methods of transportation. The passenger traffic officers through their association can aid materially in securing this unity of policy.

Presenting a United Front on Grade Separation

WHILE there is a gradually increasing tendency to recognize the justice of requiring the public to bear some of the cost of grade separation work, opinions differ widely as to the proportion of the total burden which it should carry. There is also lack of agreement as to the principles or bases upon which the apportionment should be made. Progress is being made, however, and with the progressive transfer of authority over such matters from municipal and county officers to state commissions, the public is being represented with greater intelligence and fairness. But the problem is by no means solved, and one obstacle in the way of a more favorable solution is a lack of agreement among the railroads themselves as to the principles involved. In presentations before state authorities the proposals made by one railroad are not infrequently met with the statement that other arguments are being offered by other carriers. This is an unfortunate state of affairs and efforts are being made to correct it through such agencies as the Committee on Grade Crossings of the A.R.E.A. Until the railroads agree among themselves on a basis for the division of this cost, they cannot expect to obtain the fullest measure of success in their endeavors to obtain a more equitable division.

Intermediate Terminals

IN the midst of the campaigns to promote greater rapidity of car movement through large yards, the importance of increasing the speed through the small or intermediate terminals should not be overlooked. Two modern operating practices, extended engine runs and maintracking, are directed principally at reducing the time consumed by freight trains at intermediate terminals. In fact, in a number of cases, by the efficient use and combination of both of these practices, it has been possible to close intermediate terminals entirely. In far more cases, however, because of local operating conditions, the intermediate terminals must be maintained, although in every instance long engine runs, coupled with the maintracking system and proper study and supervision, have resulted in savings in time. The matter of proper supervision presents some difficulties. The intermediate terminal may be anywhere from 100 to 250 miles away from division headquarters, so that the division superintendent and his trainmasters can only visit it occasionally. There is a further difficulty in the character of the supervisory forces employed at these intermediate terminals. In general these men are excellent citizens, with many years of service to their credit at the same location, if not in the same job. They form a self-sufficient and loyal group. In one way, this is an advantage, but it has the drawback that these men are used to running their small terminal in a certain way—the way it has been run for years—which renders any changes difficult. The first thing to do in improving the movement is to carry out a campaign of education among these men. It is important that they be taught to view car movement from a system or at least a division standpoint, rather than knowing only the problems of their own small bailiwick. It is not to be expected that the local yardmaster or engine-house foreman will be able to revise his operations to conform with modern standards without outside aid. Roads whose division or general officers have studied the problems of intermediate terminals and evolved new methods of operation, have found the practice to be well worth while.

The British Railways Set an Example

THE British Railways, in recently securing the passage by Parliament of bills extending their corporate powers to include authority to operate highway vehicles, have won a noteworthy victory in the field of public relations. They did not win without a hard fight, however, and this fact, combined with the completeness of the success they attained, invites the interest of, and possibly emulation by, railways in other countries which are faced with a similar problem. "Thrice is he armed that hath his quarrel just"—and the railways, having plain justice as well as the best interests of industry and the public in their favor, had only to get the facts known and accepted to win. Getting the facts known is not so easy, however,—especially when there is a numerous, able and well-financed opposition, composed of special interests, which may be able to produce half-truths, innuendoes and arguments for the unthinking as fast as anyone can bring forth actual facts. Again, truth is not necessarily easier to understand and accept than a neatly disguised half-truth or worse. The British railways, therefore, deserve credit for the strategy of their battle. Perhaps the outstanding feature of this strategy was an absolutely united front and centralized leadership—a policy to which all companies subscribed and energetically supported. Not only were they a unit in knowing what they wanted and why they wanted it, but their organized employees—700,000 strong—were with them to a man in the fight. An article by Alfred W. Arthurton of the British Railway Companies' Association, giving an account of the passage of these bills and the campaign which preceded enactment, appears on another page of this issue. In the issue of the Motor Transport Section, to be published with the *Railway Age* of October 27, the full text of one of the railway road power bills will appear.

Exact Knowledge Concerning Wheel and Rail Reactions

AMONG the physical problems of railroad operation concerning which little accurate data are available for any adequate study of which research is necessary, none is perhaps of more basic importance than the reactions between rail and wheel. This problem has already received attention in so far as the locomotive is concerned, and several tests have been conducted to determine rail stresses produced by locomotive truck, driving and tender wheels. For some time, however, there has been a growing doubt in the minds of engineers interested in this problem, both from the viewpoint of track and rolling stock, as to whether the most severe track stresses are produced by the locomotive, and the study of wheel and rail reactions with modern heavily loaded freight cars offers an attractive field for the development of a fund of exact information which may be of great practical value. Elsewhere in this issue is described a research plant which has just been completed at Baltimore, with which accurate

data will be obtained on certain phases of car wheel and truck reactions under any track conditions.

This plant consists of track, the condition of which can be controlled and measured, and two research cars equipped with instruments designed to measure and record accurately the truck-spring reactions, lateral shocks, body roll and speed as affected by a variety of truck conditions. It will undoubtedly furnish a fund of accurate data bearing on the question of freight-car derailments and track reactions concerning which, at present, there are many theories but little exact knowledge. Following a series of formal tests at the plant, the cars which are completely equipped for use in regular road service, will be available to the railroads for such further studies as they may wish to make. T. H. Symington, who has designed and built the plant, is not new in the field of railroad research. He designed and built the draft gear plant at Rochester, N. Y., and also designed and built the Symington Company's side-frame test plant at Baltimore. He also has contributed several articles to the *Railway Age* analyzing wheel and rail reactions, particularly with relation to freight car derailments and transverse rail fissures. The two cars, offer the railroads a splendid opportunity for removing from the realm of the unknown to that of the known one important factor in freight car operation.

The Matter with the Railways

THE announcement that John Coolidge, son of the president of the United States, had chosen railroading as a career and become an employee of the New York, New Haven & Hartford, inspired the Chicago Tribune to publish an editorial entitled, "John Coolidge's Career", which is reproduced elsewhere in this issue of the *Railway Age*. Although an extreme supporter of an economically unsound government policy regarding inland waterways, the Chicago Tribune usually has been a strong advocate of fair and constructive regulation of railways. The editorial we reprint from it is significant and eminently worthy of comment because it is an utterance of a newspaper that never shows any prejudiced animosity toward the railways, and expresses views regarding the railroads which we apprehend are somewhat prevalent among intelligent people.

With some of the views expressed we agree. It is true that most railways serving the southern and western territories have too few directors who live and do business in these territories. It is true also that the railways have done too little to increase their outstanding stock and diffuse the ownership of it among their employees and customers. One of their fundamental weaknesses, as compared with the public utilities, in dealing with public sentiment and regulation is that they have not large numbers of stockholders in their own territories who take a keen interest in their problems and, in their own selfish interest, vigorously combat propaganda and government policies tending to prevent the railways from enjoying reasonable prosperity.

Advancement in Railroad "Bureaucracy"

There are other views expressed in this editorial which are either contrary to the facts or so disregard or misstate them as to produce false and harmful impressions. "Advancement through the bureaucracy of a railroad", says the Chicago Tribune, " is probably slower than in most other fields." The offensive word "Bureaucracy" is no more applicable in the railroad than in any other field of American industry or commerce. In no other city are there so many railway officers whose careers tend to refute the statement quoted as in Chicago, Hale Holden entered railway service as an attorney in 1907, and in seven years, when only 45 years old, became president of the Burlington. After having practiced law in Iowa, Fred W. Sargent came to Chicago as general solicitor of the North Western in 1921, and in four years, when only 49, became president of that railroad. Colonel N. L. Howard was only 41 when he became president of the Chicago Great Western. H. R. Kurrie was only 39 when he became president of the Monon. L. A. Downs worked his way up from the bottom through the engineering and operating departments, but he was only 52 when he became president of the Central of Georgia, and 54 when he became president of the Illinois Central. H. A. Scandrett was 52 when he became president of the Milwaukee. The late C. G. Burnham was only 30 when he became vice-president of the Burlington. The late C. M. Kittle became vice-president of four different railroads. We could multiply ex-service after having had opportunities to become president of four different railroads. We could multiply examples of this kind from various parts of the country. Fairfax Harrison of the Southern became a railway president at 41, and Ralph Budd of the Great Northern at 40. Railroading is still, as it always has been, "a career open to talent." No matter where a man starts in it he has a chance to become a president. He has as good a chance to rise to one of the highest positions in the industry while still young as he would have in any other industry.

Increased Railroad Efficiency

It is true, as the Chicago Tribune intimates, that the prospects of the railroad industry are not as rosy now as could be wished. But why is this so? Is it due to failure by railway managers within recent years to develop, manage and operate the properties with as much public spirit, courage and efficiency as their predecessors? On the contrary, allowing for the conditions under which they have worked, the railway managers of this generation can be credited with achievements equalling or surpassing those of any earlier generation. In spite of adverse conditions they have invested so much capital and used it with such skill, they have been so successful in gaining the co-operation of shippers and employees, that railway properties have been put in unprecedentedly good condition; that railway service has been made better than ever before, and that, in proportion to the wages and prices they must pay, the railways are more economically operated now than ever before. Since 1920 the average speed of freight trains has been increased 25 per cent; the average number of freight cars in each train, 34 per cent; and the average hourly service rendered by each train in carrying freight, 38 per cent, while the amount of fuel consumed in proportion to the service rendered has been reduced 22 per cent. The Chicago Tribune refers to "congestion in rail terminals". There has been practically no such congestion for five years. Car shortages have been so completely eliminated that month after month shippers are furnished practically one hundred per cent of the freight cars for which they ask at the exact time and place for which they ask them.

What, then, is the matter with the railways? Is it a fact, as the Chicago Tribune intimates, that "the imag-

ination and energy" of railway officers has been crushed by "rigorous regulation inherited from a generation which hated and distrusted the railroads"? There is such regulation, but facts such as we have cited regarding recent progress in the industry refute the intimation that its managers have lost their imagination and energy and that there is not still opportunity to rise in it and achieve much by the exercise of these qualities.

What is Really the Matter?

And yet there are some things the matter with the railroads. One of these is that, as the Chicago Tribune says, the motor vehicle, the airplane and barge lines are supported in part by the taxpayers, while the railways not only receive no help from the taxpayers, but are taxed to help competing means of transportation. Another thing that is the matter with them is that, while they are rigorously regulated, competing means of transportation are not only subsidized by the government but are not thus regulated. Another thing that is the matter with them is that even their rates that are not subject to the subsidized competition of other means of transportation are constantly held down or reduced to help agriculture and other industries whose condition the railways are not responsible for.

It might not seem unreasonable to expect that a newspaper which recognizes, as the Chicago Tribune does, the peculiar handicaps to which the railways are subjected would suggest as a remedy that either their handicaps should be reduced or those of their competitors should be increased. It does not do so. It refers to a "renaissance of inland waterway traffic for bulk freight". It says, "the trucks are taking much of the short haul freight". It ignores the conditions which enable trucks to take short haul traffic and the fact that such "renaissance of inland waterway traffic" as may be occurring, or threatening to occur, is due entirely to the fact that the government is not only contemplating vast expenditures of the taxpayers' money upon waterways, but has actually engaged in the ownership and operation of a barge line upon the Mississippi river system in competition with the railways, and apparently is to render and extend its service almost regardless of what it may cost the taxpayers. Curiously enough, the Chicago Tribune, which frequently inveighs against socialistic projects, is one of the strongest supporters of this completely socialistic barge line project.

The Tribune's recommendation to the railways as a means of saving themselves from disaster is that they should "make a greater effort than they are now putting forth to win popular regard". It says they have been laggard in improving their terminal facilities and electrifying their lines in Chicago. It intimates that they should "show a more alert regard for the interests of the individuals and communities they serve". How could they show more regard for the interests of the public than they have shown by the improvements in their facilities and service and by the economies they have effected within recent years? One might almost think the Tribune is so provincial that it believes the railroads of the United States have no duty to anybody excepting those who want them to build new passenger terminals and electrify in Chicago. What encouragement is the public offering the railways to make such improvements? They have invested $4,000,000,000 of new capital in their properties during the last five years, and the difference between their net operating income in 1923 and 1928 is sufficient to pay a return of only about 1½ per cent upon this new capital. Will anybody give them any assurance that they would be allowed to earn even 1½ per cent upon the huge investment that would be required to build new passenger terminals and electrify their lines in Chicago?

False Economic Doctrine About Transportation

The intimation of the Chicago Tribune that the railways are struggling against public animosity is unfounded. There is less hostility toward them at present than ever before in a quarter century. What, then, are they struggling against? They are struggling against a public policy which is subsidizing highway and waterway competition with them; which forces them to make many investments in facilities that do not result in operating economies; which involves regulation of their rates for the benefit of other industries, regardless of the effect on the railroad industry; and which encourages arbitration boards to award advances in the wages of their employees, regardless of the effects on railway net earnings. This policy is not due to any current public animosity toward the railroads. It is due to a public sentiment created by the constant preaching of false economic doctrine regarding transportation matters by those who really are not hostile to the railroads, but who are not less dangerous on that account. We regret to say that the Chicago Tribune, while manifesting solicitude about the railways, is one of the ablest and most effective preachers of some of this false economic doctrine. It clouts the railways for not seeking public friendship, and at the same time intimates that railway management is moribund, although it never was more efficient than now. It says little of the lack of regulation of competing means of transportation, but apparently blames the railways for not better meeting competition. It advocates huge expenditures on terminal facilities in Chicago, while telling its readers that the future of Chicago depends largely upon government-aided water transportation to be used in diverting from the railways the revenues needed to enable them to make the terminal improvements which it urges them to make in Chicago. And its attitude toward transportation matters is no more inconsistent than that of most of the business men of Chicago and the rest of the country.

Rates, Wages and "Fair Return"

WILL it sooner or later become essential to the solution of the railroad problem of the United States that the regulation of the wages and working conditions of employees, as well as the regulation of railway rates, shall be delegated to the Interstate Commerce Commission? This question is entitled to more serious consideration than it has been given. It is raised in an unusually forcible way by what is occurring at the present time in western territory, and especially in that part of it which is known as "western trunk line territory."

There are eleven railways which operate 75 per cent of their mileage, or 37,200 miles of it, in western trunk line territory, and five more which have from 55 to 75 per cent of their mileage, or about 19,000 miles of it, in that territory. The railways serving the territory have been, during the last seven years, the most unprosperous group of carriers in the country. Those having 75 to 100 per cent of their mileage in this particular territory have earned an average return upon their property investment of only 1.84 to 3.33 per cent, their

average for the seven years having been 2.94 per cent. In its decision declining to grant the railways of the entire western territory the 5 per cent general advance in rates for which they asked, the Interstate Commerce Commission recognized the fact that the needs of the roads in western trunk line territory were especially great and pressing, and used language sounding like an intimation to them to institute special proceedings for advances in their rates. They have done so. They have before the commission an application for advances in their class rates which, it is estimated, would, if granted, increase their annual earnings about $24,000,000. They also have before it a case for an advance in their rates on livestock. If all the advances for which they are asking were granted, the increase in their earnings would still be far from sufficient to give them a fair return, measured by any standard the use of which ever has been proposed. Some of the business interests of the territory have co-operated with the carriers in their efforts to work out new and higher schedules of rates. The territory is, however, predominantly an agricultural one, and from some sources there is opposition to the advances upon the ground that they would be unduly burdensome to the territory's commerce.

Shippers' and Employees "Rights"

While the legal and traffic officers of the railways have been preparing and filing exhibits and briefs in these cases, committees of their operating officers have been in negotiation with different groups of their employees regarding proposed advances in wages. These negotiations have, in some cases, been followed by arbitrations under the Watson-Parker Railway Labor Act, all of which have resulted in advances in wages. A committee of managers recently has offered the conductors and trainmen of all the western lines a 7½ per cent increase in their wages to bring them up to a level with those of other train service employees upon condition that they will accept modification of certain wasteful operating rules, or a 6½ per cent increase if these rules are not to be changed. The strike on the western lines which recently has been threatened has been due to the fact that the conductors and trainmen have insisted that they must be given the 7½ per cent advance and allowed to keep the rules.

Upon what legal or economic ground do railway employees base their demand for advances in wages by railways which, during the last seven years, have earned an average of less than three per cent? They contend that they are entitled to and should be given reasonable wages regardless of the net returns, past, present or prospective, of the railways for which they work. Upon what legal or economic ground do shippers oppose advances in the rates of railways that have been earning an average of only three per cent? Upon the ground that proposed rates would be burdensome to the commerce to which they are applied, and therefore unreasonably high, and that the shipper is entitled to reasonable rates regardless of the past, present or prospective returns of the railways that serve them.

But have the railways themselves no rights? Theoretically, they have. They have as good a right theoretically to earn a fair return as the employee has to enjoy reasonable wages or the shipper to enjoy reasonable rates. But what becomes of this theoretical right of the railroads if we fix both wages and rates in accordance with the assumption that the rights of the railways are inferior to those of both employees and shippers? Past results in western trunk line territory partially supply the answer. The railways of that territory have been theoretically entitled throughout the last seven years to a fair return, but actually have earned less than three per cent because their claims and needs have been subordinated to the claims of both employees and shippers. If those who have regulated wages and rates have been justified in doing this, it would be difficult to show they would not be justified in giving the employee "reasonable" wages and the shipper "reasonable" rates even if the result should be to leave the railways without any net return at all.

Obviously, however, the railways would stop running if deprived of all net return. Then the shippers would be without railway service and the employees would be without jobs. But the moment we concede the practical and indisputable fact that the railways would have to cease to operate if allowed no net return at all, we have completely destroyed the theory that rates and wages should or could be fixed regardless of railroad net return. Having been forced to concede that the right of the railways to earn some return must be recognized, we are necessarily and immediately faced with the question of how much this return should be. The courts repeatedly have answered they are entitled to a fair return, and their answer has been written into the Transportation Act. How does it happen, then, that groups of railways, or the railways as a whole, constantly fail to earn the returns to which the courts and the law say they are entitled?

Regulation of Rates and Wages

Unquestionable, it is mainly due to the fact that we have had for many years, and still have, a policy of government regulation under which the rates of the railways are fixed by the Interstate Commerce Commission, and under which their wages have been, and still are, directly or indirectly, regulated by other government agencies. It is plain that each of these agencies has, to a large extent in the past, disregarded, and still is disregarding, what each of the other agencies has been and is doing. Most arbitration boards organized under the Watson-Parker act have awarded advances in wages completely regardless of the returns being earned by the railways that must pay them. They have said in effect, that it is the Interstate Commerce Commission's job to see that the railways get high enough rates to pay the advances in wages. What weight does the commission, in regulating rates, give to advances in wages made directly or indirectly as a result of awards by arbitration boards organized under the federal law? Nobody knows. What we do know is that advances in wages have been accompanied by reductions of rates although the net return being earned by every group of railways has been less than a fair return. It is to be hoped that the decisions of the commission in the cases involving advances in the rates of the western trunk line carriers will throw light on its attitude toward recent advances in wages.

It seems quite certain, however, that, in the long run, the railways will be unable to stand regulation of their rates and regulation of their wages carried on practically regardless of each other. Shall arbitration boards be required to accept as reasonable rates fixed by the commission? Shall the commission be required to accept as reasonable wages fixed by the arbitration boards? Or must the regulation of both rates and wages be delegated to the same tribunal? It is becoming more and more evident that sooner or later one of these policies must be adopted, either by means of legislation expressly for that purpose or in some other way.

Freight Platforms Are Kept Clean on the Central of Georgia

Friendly Rivalry Results in Improved Freight Handling

Central of Georgia reduces claim payments substantially by concerted effort to reduce exceptions

THE Central of Georgia paid $592,524 for freight claims in 1920, a ratio of 3.83. In 1927, only $138,337 was paid in claims, a ratio of 0.66. Much of the credit for this saving of nearly half a million dollars annually is attributable to the concerted efforts made to improve freight handling and reduce exceptions. For example, in 1927, the tons of freight handled per exception averaged 360 for the entire system, as compared with 168 tons in 1923, or an improvement of 114 per cent in this important factor.

In 1921, Chattanooga led the nine larger stations with 67 tons per exception. In 1927, each of these nine stations far exceeded this average, the highest averaging 501 tons, the lowest 193 tons. During this period, these nine stations raised their average from 43 tons per exception to 299 tons, or an improvement of 595 per cent. All of the stations showed improvements of at least 400 per cent, while the station at Atlanta, Ga., increased its average tons per exception from 28 in 1921 to 501 in 1927, an improvement of 1,689 per cent.

These results have been attained by creating a spirit of friendly rivalry between the stations, by close supervision, and by complete co-operation on the part of the employees, the last being a most important factor. The cordial relationship existing between the employees and the management, which aided materially in producing these results, was described in detail in an article appearing in the *Railway Age* of June 9, 1928.

Another important factor has been the annual efficiency meetings, inaugurated in 1912. At these meetings, the station agents have an opportunity to compare notes and arrange matters as betweeen their various stations in a manner that could not otherwise be accomplished. The scope and activities of these meetings were described in the *Railway Age* of January 24, 1925, page 259, and March 14, 1925, page 751.

It was at one of these meetings that the competitive idea originated. For purposes of comparison and to equalize the competition, the 9 largest stations were rated as Class A, with 12 of the smaller stations as Class B. The Class B stations now number 18, six additional stations having been admitted to this classification since 1921.

At the annual meeting in 1922, ribbons were awarded to the stations in the two classes making the best showing in average tons per exception for 1921. So great was the interest and enthusiasm, however, that silver loving cups were awarded to the leader of each of the two classes at the 1923 meeting. The winners of the cups are entitled to possession for one year, except that, if the cup is won three times by the same agency, that agency acquires permanent possession of the trophy.

In addition, each local station not classified in the contest which makes a perfect record in freight handling for the year, is awarded a testimonial of merit. It is, of course, impossible to obtain any definite record of exceptions to freight loaded at Central of Georgia stations destined to off-line points. Accordingly, the standing of the agencies is figured only on such freight as is consigned to other Central of Georgia stations, or which breaks bulk at stations along the line.

The improvements made by the Class A stations previously quoted, have not been the only excellent performances. The Class B stations have also made exceedingly good showings. In 1921, the average number of tons handled per exception at Class B stations was 277, as compared with 2,486 tons in 1927, or an

improvement of 793 per cent. The highest average for 1921 was 599 tons, whereas, in 1927, no less than 13 of these stations averaged more than 1,000 tons per exception. Among the stations which have made remarkable improvements are Americus, Ga., improvement 4,928 per cent; Fort Valley, Ga., 3,877 per cent; Tennille, Ga., 3,815 per cent; Griffin, Ga., 2,699 per cent; and Cuthbert, Ga., 1,565 per cent. The agency at Cuthbert has had only one exception in the past three years, while handling about 7,000 tons annually.

Comparative Record of Improved Freight Handling

Division	Tons Per Exception 1927	1923
Macon-Chattanooga	541	194
Savannah	347	203
Southwestern	300	244
Macon Terminal	273	68
Columbus	240	133

The detailed figures of these performances, shown in the accompanying tables, afford an interesting commentary on the progressive improvement in freight handling on the Central of Georgia.

Improvement at Local Stations

As may be seen from the statement of divisional performance, the local stations have been keeping pace with the larger agencies. A spirit of competition is fostered at these stations by the annual award of some trophy to all local agencies having no exceptions whatever during the year. Blue ribbons were awarded to such stations in 1923, medals in 1924 and 1925, initialed fountain pens in 1926, and engraved testimonials of merit in the past two years. The progressive improvement in freight handling at the unclassified stations is shown by the following comparative report of the number of annual awards for perfect records:

This Testimonial of Merit
is issued by the
Operating Department
of
Central of Georgia Railway Company
to
Agent
in recognition of the general excellence in freight handling
Certifying that one hundred per cent efficiency was
attained during the calendar year
1927
Savannah, Ga. January 1st, 1928
Assistant General Manager

Testimonials of Merit Are Awarded for Perfect Freight Handling

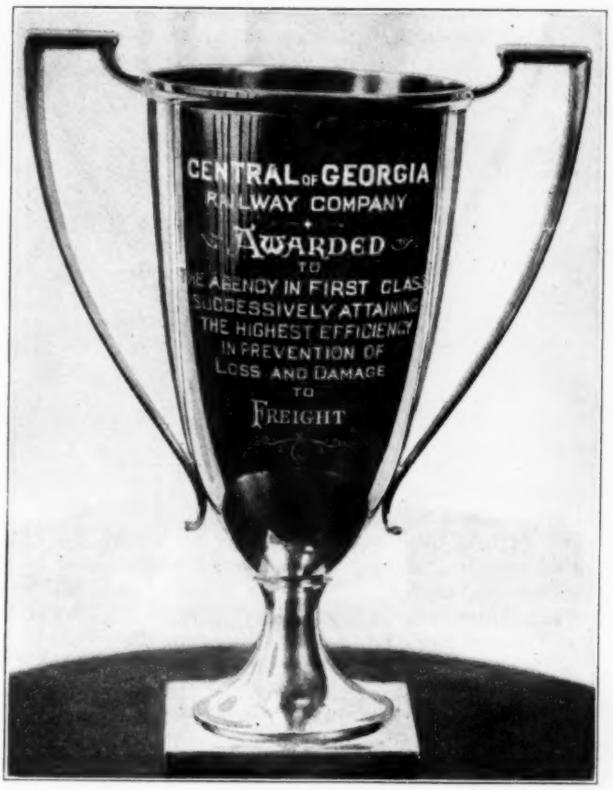
1922	16
1923	32
1924	45
1925	53
1926	55
1927	75

A number of the smaller stations have achieved perfect freight handling records for each of the past three years, and some for four or five years.

The entire campaign is directed by the assistant general manager. Four route agents are employed, who ride local freight trains to check up the loading, both to prevent loss and damage and to see that the proper station order is maintained. These men also visit stations to assist and instruct the agents as to the proper methods of handling freight, billing, etc.

The assistant general manager receives reports of all exceptions on the system. A weekly summary is made out, containing this information, together with comments as to how this or that exception might have been avoided. These are mailed so as to reach the agents each Tuesday morning. Each agent at Class A and Class B stations holds a staff meeting every Tuesday, where the responsibility for each exception is placed. An intense rivalry exists among the trucking gangs at the various stations, in addition to the inter-station competition. Usually, the trucking gang with the worst record is required to pay some penalty by the members of the other gangs. Generally this takes the form of buying tobacco for the other gangs, but, on at least one occasion, the losing gang was required to run a gauntlet of the other gangs, all of whom were armed with barrel staves and applied them vigorously to the persons of the losers.

The assistant general manager's office also issues periodical bulletins covering the proper handling of cer-



The Winning First Class Agency Receives This Cup

Exception Record of Class A Agencies
Central of Georgia, 1921-1927

Agency	Tons of Less Than Carload Freight Handled Per Exception 1927	1926	1925	1924	1923	1922	1921
Atlanta, Ga.	501	511	521	397	183	125	28
Chattanooga, Tenn.	467	349	326	363	162	109	67
Augusta, Ga.	322	154	186	242	220	165	44
Macon, Ga.	273	157	117	98	68	67	40
Savannah, Ga.	256	360	278	190	163	166	34
Albany, Ga.	228	133	157	286	247	79	42
Columbus, Ga.	216	240	304	237	161	124	47
Montgomery, Ala.	237	135	125	169	116	90	46
Birmingham, Ala.	193	122	147	118	64	62	37
Average All Class A Agencies	299	240	240	233	154	110	43

tain commodities, usually pointing out the undesirable results that have occurred from erroneous handling. Bulletins are also issued covering the proper handling of seasonal movements. A monthly report is also issued, through the superintendents, to all Class A and B agents containing an itemized statement of all exceptions occurring during the month, with comments and suggestions for improvement.

Exception Record of Class B Agencies
Central of Georgia, 1921-1927

	Tons of Less Than Carload Freight Handled Per Exception						
Agency	1927	1926	1925	1924	1923	1922	1921
Americus, Ga.	6,789	2,625	2,698	7,336	279	199	135
Griffin, Ga.	6,691	508	1,068	501	139	260	239
Cuthbert, Ga.	6,662	5,537	6,942	1,966	1,841	3,903	400
Sylacauga, Ala.	5,451	911	788	919	756	1,101	*
Ft. Valley, Ga.	4,495	2,979	4,669	4,229	773	208	113
Newnan, Ga.	3,287	2,683	1,352	2,839	477	254	*
Cedartown, Ga.	2,352	3,005	2,449	1,790	803	2,434	*
Troy, Ala.	2,056	2,168	1,627	1,416	554	2,418	*
Tennille, Ga.	1,957	611	1,132	571	242	293	50
Eufala, Ala.	1,799	2,909	908	1,170	1,248	2,029	583
Dothan, Ala.	1,731	1,895	2,324	2,415	849	786	334
Millen, Ga.	1,533	1,653	1,319	1,546	535	949	599
Union Springs, Ala.	1,123	2,362	1,182	2,491	1,101	4,796	*
Milledgeville, Ga.	788	850	1,276	3,790	1,187	1,509	188
Athens, Ga.	563	1 162	1,152	1,894	745	1,113	466
Wadley, Ga.	516	1 054	711	2,062	1,436	964	*
Rome, Ga.	493	752	466	432	320	82	56
Opelika, Ala	465	818	489	496	518	471	165
Average All Class B Agencies	2,486	1,915	1,752	2,103	770	1,320	277

* Not Classified as a Class B Agency in 1921.

The various divisions periodically set aside "no exception months," during the course of which every exception occurring on the division must be reported to the superintendent personally by wire. These have proved successful and they are occasionally extended so as to include the entire system on certain months.

The campaign has been aided by the awarding of a cup each year to the division making the best showing in loss and damage prevention, elimination of personal injuries and fuel conservation. There is a spirited rivalry among the superintendents for the honor of winning this cup and it is surprising to any observer to see how the spirit of competition extends down the line from the superintendent to the most recently employed trucker on the freighthouse platform.

"John Coolidge's Career"*

YOUNG John Coolidge has gone to work for a railroad. We do not know whether his father helped him get the job, but it is safe to say that the young man, with or without his father's assistance, could have found employment in any office, shop or factory at which he applied. Young Coolidge has gone into railroading, we are inclined to believe, because he thinks it offers most to a man with college training and an ambition to succeed.

The choice is an unusual one. The number of young men—excepting, of course, those who have been trained in engineering colleges and the sons of railroad executives—who go from college to railroad offices must be small indeed. Offhand, we should say that for every young bachelor of arts who becomes a railroad man there are fifty who go into the banks, the bond houses, and the advertising agencies.

Perhaps the others are right and John is wrong. Advancement through the bureaucracy of a railroad is probably slower than in most fields. There is the additional discouragement to the ambitious that the railroads themselves are no longer as essential in the life of the country as they once were. The buses and the airplanes are cutting deeper every day into passenger revenues. The bus takes the short hauls now and the airplane is likely to take the long ones before many years. The prospect for freight traffic is little better. The tendency in industry is against the movement of bulk freight by rail. Oil moves by pipe line; more efficient power plants burn less coal and burn it nearer the mines. Congestion in the rail terminals and lower costs are bringing a renaissance of inland waterway traffic for bulk freight. The trucks are taking much of the shorthaul freight.

The outlook for the railroad industry is anything but rosy in the autumn of 1928. It is not the sort of business which ordinarily attracts young men. The railroads are on the defensive. The opportunities they offer for advancement in popular esteem and at the bank do not stimulate the imagination. Perhaps the chief deterrent to young men who might otherwise go into the railroad business is the knowledge that the imagination and energy they might contribute to the industry would be crushed by rigorous regulation inherited from a generation which hated and distrusted the railroads. The railroad executives dare not turn around without asking permission of the interstate commerce commission or some state commission. In marked contrast is the freedom with which industrial and financial executives can develop new ideas.

In this crisis the railroads ought to be exerting every effort to gain the friendship of the public. The taxes paid by the railroads are helping to build the roads upon which the buses and trucks are running. The taxes of the railroads are helping to buy and equip municipal landing fields for airplanes. It is paradoxical but true that the bus, airplane, and barge lines, which are supported in part by the taxpayers, have the friendship of the public, while the railroads, which contribute heavily to the treasury, still must struggle against popular animosity. To the railroad companies this situation is more than paradoxical; it is tragic. They might win the fight against rival means of transportation, but they cannot hope to win if their competitors have the customers as allies.

Under the circumstances it is astonishing that the railroads do not make a greater effort than they are now putting forth to win popular regard. The power and light companies showed the way. These corporations enlisted their customers as stockholders. The larger railroads have not followed this example. Recent articles by Harper Leech showed how limited is the representation of Chicago and middle western industry and finance upon the boards of the railroads which depend largely upon midwestern business for their prosperity. The railroads have been laggard in improving their passenger terminal facilities, except in the east. Only one of the railroads entering Chicago has electrified any of its services, and none of them has yet electrified the through passenger lines entering the city. The directors are easterners who do not seem aware of the fact that they are driving their best customers into the ranks of the enemy.

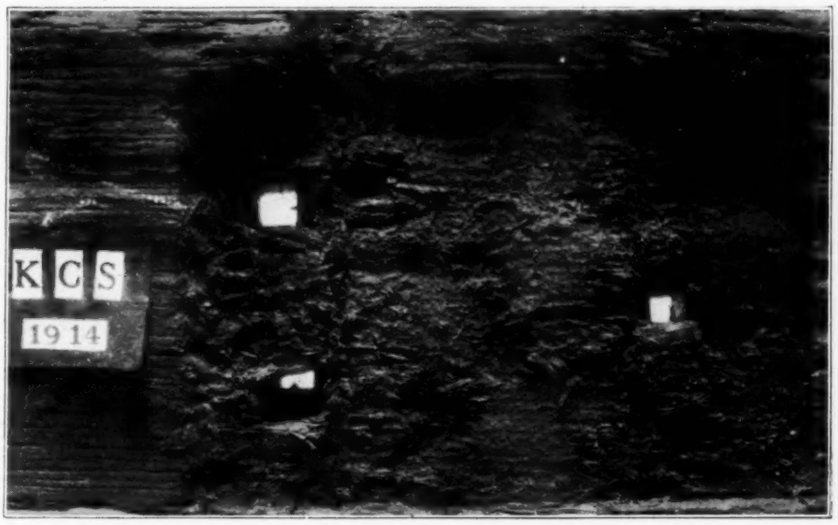
We do not suggest that the difficulties which now confront the railroads will disappear if railroad directors or higher control show a more alert regard for the interests of the individuals and communities they serve. We do say that unless the railroads win the friendship of the public they cannot hope to win through. And they will not deserve to do so.

*An Editorial from the Chicago Tribune of September 15, 1928

Mechanical Injury to Crossties Ascribed to Wear*

Failure to prevent the movement of tie plates held responsible for the depression of the bearing surface

By Dr. H. von Schrenk
Consulting Timber Engineer,
New York Central,
St. Louis, Mo.



A Typical Example of Wear Caused by Tie Plates—Bearing Surface of a Red Oak Creosoted Tie

MECHANICAL wear manifests itself by the apparent sinking of the tie plate or rail into the tie, so that sooner or later the tie plate looks as if it had sunk into a pocket. In some cases this pocket is deep enough so that the top surface of the tie plate is lower than the original top of the tie, and the rail has then begun to sink into the edges of the tie. These pockets are generally almost the size of the tie plate. The word "almost" is used advisedly, meaning thereby that the fit of the plate in the hole is almost snug. In most cases, however, the pocket is just a little larger. It was extremely difficult to obtain any exact measurements because of the nature of the walls of the pocket and the disintegration of the wood at the edges of the tie plate. It may be said, however, that frequently the difference in size between the pocket and the tie plate does not exceed $\frac{1}{16}$ in., although often it is considerably more. The harder the wood, the closer fit there is.

In general, this sinking is most marked with the usual type of track construction, using cut spikes as the fastening. Where the tie plates are partially fastened to the tie, as has been the practice on the Delaware, Lackawanna & Western for some years, this sinking in of the plates is less marked. It is still less noticeable on ties on which the tie plates have been fastened to the tie independent of the rail, as on the Pittsburgh & Lake Erie.

Appearance of Worn Surfaces

Considering the appearance of mechanically worn ties in which the rail is fastened by the use of cut spikes, it will be noted that in practically all cases, provided the plate has been in service for a sufficient length of time, the surface of the wood immediately under the plate is rough, fibrous or splintered. The extent of the splintering or shattering differs with the types of tie plates used, the kind of wood, the type of ballast and the extent of traffic. The softwoods such as pine, fir, cypress and redwood, usually sliver and splinter, whereas the hardwoods, such as red oak, beech, maple, etc., more frequently look fuzzy or woolly. In most cases, both in pine and hardwoods, groups of wood cells become separated from the body of the tie and it is comparatively easy to tear off splinters or even chips. This splintering or breaking away of masses of wood fiber immediately under the tie plate is very evident when longitudinal sections of the rail bearing are made. A study of these ties shows that this splintering goes to various depths; in some cases it is confined to the immediate surface, in other cases it may extend into the tie for ½ in. or more. In the majority of cases, however, the breaking up of the fibers is more or less a surface matter. Numerous microscopic examinations of these chips or splinters have shown that they were invariably sound wood fibers, that is, not decayed, and, that in most cases, the fibers were considerably broken.

Examinations of ties with partially fastened tie plates on the Lackawanna indicate that the surface immediately under the tie plate is very much smoother than is the case under loosely fastened plates where cut spikes are used, and sections of such ties show that the splintering is confined more or less to the surface. An illustration is shown of a hardwood tie on the Pittsburgh & Lake Erie in which the plates had been firmly fastened. Note particularly the smooth character of the surface immediately under the tie plate after 12 years of service, and the slight sinking in of the plate.

Few Ties in Which Compression Is Evident

In order to determine the condition of the wood fiber under the tie plate, a large number of longitudinal and cross sections were made of ties in which very considerable mechanical wear was evident. A section

* Abstracted from a monograph published by the American Railway Engineering Association in Bulletin No. 306, June, 1928, and based on an investigation of a large number of ties, supplemented by studies of microphotographs made at the Forest Products Laboratory of the United States Forest Service.

is shown of a typical mechanically worn creosoted red oak tie which had been in service for 12 years in chat ballasted track. The maximum locomotive axle load operating over this track is 63,000 lb. and the extent of the traffic may be gaged by the fact that in 1926 approximately 5,000,000 tons passed over this particular tie. A large percentage of these badly rail worn or mechanically worn ties show no evidences of compression, as indicated by the direction of the wood fibers, when comparing the regions under the tie plate and immediately outside of the tie plate area.

In the course of these investigations, however, a

Track on French Eastern Railway, with Wooden Shims Under Rails. The Two Ties With Squares Are Creosoted Beech and Have Been in Track Since 1871

number of cases were found which showed some deflection. The most aberrant of all was a creosoted Douglas fir tie, 21 years in track, with a tie plate 6 in. by 8½ in. The traffic over this particular track is estimated at about 8,000,000 tons per year with maximum axle loads of 50,666 lb. In the center of the bearing, distinct bowl-shaped chips occur. In this particular case, the fibers are bent to a low point in the very center of the bearing. At both bearings, the tie apparently failed by shearing. Particular attention is called to the fact that this appears to be a compression failure.

It was thought that further data might be obtained from a study of cross sections of ties made through the center of the tie plate bearing area. It was very evident, from a study of photographs of such sections, that there is practically no evidence of compression of the rings. What the photographs do show is that the one to two inches of wood which originally filled the cavity finally occupied by the tie plate have disappeared. The significant point is that they have disappeared entirely. The wood, in other words, has not been compressed under the tie plate during its years of service, because if it had been, this compressed wood would still be evident, particularly when viewed in cross section.

Summing up the foregoing, detailed examinations of the sections of ties through the badly mechanically worn areas show little evidence of compression or deformation. There are, undoubtedly, ties which have been stressed beyond the elastic limit, but they are apparently the exception and not the rule. The conclusion which I have drawn from this study, both of surface and of longitudinal and cross sections, is that there is little evidence of extensive compression of wood fibers.

A number of typical mechanically worn ties were selected for a microscopic study. In each case, a typical area on the tie plate seat and a similar area in the region outside of the tie plate seat were selected. In making these microscopic studies, the ties selected were taken from three groups; first, typical ties in which the rail was fastened with two cut spikes; second, typical ties from the Lackawanna in which the rail was fastened with two screw spikes, which at the same time held the tie plate more or less firmly to the tie; and, third, typical ties from the Pittsburgh & Lake Erie in which two cut spikes held the rail and two screw spikes held the tie plate entirely independent of the rail. A careful microscopic study of the structure of these badly rail worn ties can lead to only one conclusion. The wood under the tie plates, even in the worst cases, is practically normal as to the condition of the wood fiber. The changes evident are a lateral shifting of the uppermost layers. This shifting may extend down into the tie for three or four rings. It is rarely more than 45 deg. and frequently not as much as that. It is evident in oaks as well as pine. In addition to this shifting, there is a breaking away of groups of wood fiber immediately under the tie plate. These groups consist of fibers which are practically unchanged as to form.

The shifting and breaking of the wood fibers takes place in those ties in which the most motion was possible between the plate and the wood. There is far less evidence of this shifting and shattering in the Lackawanna tie plates, which were partially fastened, and practically no shifting in the case of ties from the Pittsburgh & Lake Erie in which the tie plates were independently fastened.

Wooden Shims Reduce Wear on Ties

Some twenty-three years ago I was struck by the practice of the French Eastern Railway, where the creosoted ties, chiefly beech, gave an average life of 30 years or more, with little, if any, mechanical wear. The engineers of this company claimed that these remarkable results were due to the fact that they had discarded or practically never used any type of metal tie plate, but were using compressed poplar wood shims as a tie protection. In 1879, this company started to use felt shims, placed between the rail and the tie. Early in 1893, in an experimental installation in the neighborhood of Paris, poplar shims without compression were used, and in 1903, with the invention of the compressed poplar shim, an experimental section was put in on the Paris division. By the end of 1913, the compressed poplar shim was made standard on the system and it is still so used. The shims are 4 mm., (5/32 in.) in thickness, of a width corresponding to the base of the rail, and 240 mm., (9½ in.) long. They are made of carefully selected wood and are compressed one-half. As a matter of interest, a photograph is reproduced, showing a portion of the French Eastern main line in southeastern France. The two ties with white squares are creosoted beech ties inserted in 1871, as indicated by the dating nails. They showed no evidence of any mechanical wear.

Taking all of the results of the investigations described, I am of the opinion that they point more or less to the fact that mechanical wear is due to the motion of the track parts, specifically of the rail, tie plate and tie, and that load is not the only factor.

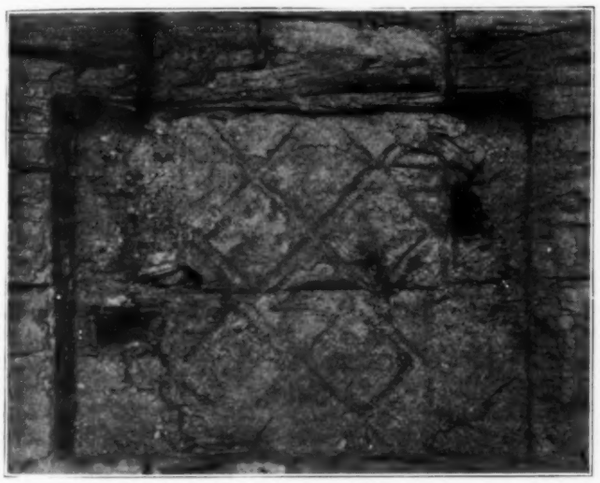
I visualize the action of the tie plate under actual traffic briefly as follows: After insertion, particles of sand, dirt, or stone creep in between the bottom of the tie plate and the wood. This foreign matter

probably acts as the abrading agent. The motion across the track and parallel to the track is probably very small. When it is remembered, however, that the diameter of vessels and wood fibers is extremely small, it will be readily seen that it takes only an infinitesimal amount of movement to extend over a considerable group of wood fibers. The rate at which this abrasion takes place will naturally depend upon a number of factors:

(1) The number and amount of impacts;
(2) The amount and kind of dirt or abrading material present;
(3) The loads exerted;
(4) The kind of wood;
(5) The type of the bottom of the tie plate; and
(6) The general character and upkeep of the track.

Conclusions

In presenting these conclusions and recommendations it is assumed that the track as a whole is of high standard, that is, with good ballast, good ties, properly tamped ties, and that the track has good line and surface. Provided the best conditions are



One of the Few Examples Showing Evidence of Crushing Rather Than Wear—A Douglas Fir Tie with a Preponderance of Springwood

maintained, an observance of the following recommendations will do much to reduce mechanical wear.

(1) Adzed and Bored Ties.—In all first-class track, only ties which have been adzed and bored before treatment should be used. The adzing gives a smooth seating for the tie plate, and to that extent reduces any irregular motion such as undoubtedly takes place in ties which have not been adzed.

(2) Canted and Cambered Tie Plates.—The use of canted and cambered tie plates will undoubtedly help in reducing the motion of the plate. With a properly designed camber and cant there is a better load distribution.

(3) Flat Bottom Tie Plate.—It must be obvious from the foregoing that the best results will be obtained where the bottom of the tie plate is free from projections, flanges or other irregularities.

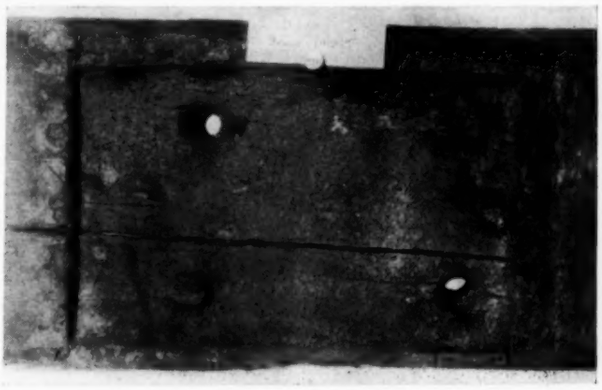
(4) Size of Tie Plate.—The size of the tie plate is a vital factor. The tie plate must, under all circumstances, be large enough to give the best load distribution under any given set of circumstances. Under heavy traffic, no tie plate should be less than 7½ in. in width, and the length and thickness should be proportioned to the traffic demands.

(5) Independently Fastened Tie Plates.—The most promising factor in reducing mechanical wear is doubtless connected with the fastening of the tie plate to the tie independent of the rail. Many details will doubtless have to be worked out to develop an ideal fastening. This ideal fastening should be simple, easily applied, easily repaired in case of accidents

Creosoted Maple Tie in Service on P. & L. E., Tie Plate Fastened to Tie with Two Screw Spikes Independent of the Rail

or wrecks, and above all, demand low maintenance expenditure.

(6) Replacement of Plates.—At the present time, whenever rail changes are made, and particularly when new plates are laid, either of different design or of larger size, it is customary to adze the ties by hand. This results in much waste of wood and frequent exposure of untreated wood, with consequent loss of decay protection. One of the most practicable remedies for this matter is the Neafie tie scoring machine, which saws an even cut without waste of wood,



Creosoted Beech Tie, 12 Years in Service on D. L. & W., Rail Fastened with Two Screw Spikes

and enables the track operator to secure a smooth, even bearing.

(7) Wooden Shims.—When first introduced the wooden shim was regarded as a possible substitute for the metal tie plate. This has given rise to much misconception. In France and Germany where the screw spike is used as a standard rail fastening, it is possible to insert wooden shims and to replace shims broken or otherwise destroyed with ease and rapidity. The pressure of the screw holds the shim in position. It is probable, with our present cut spike fastening, that the wooden shim alone will serve only

as a temporary expedient, if at all, in reducing mechanical wear. The cut spike fastening, furthermore, does not permit easy renewal of the shims where they creep out or are destroyed.

(8) Future Developments.—It should be understood that the matters discussed in this investigation are largely of a fundamental nature. If it is once understood what it is that must be solved, a better point of attack is presented. It is felt that if the motion of the tie plate is responsible for the destruction of the ties, this gives a basis for further study and development. It is believed that with the track experiments already initiated, and with others to be developed, the mechanical life of creosoted ties may be considerably extended, with a consequent large saving.

Purchasing Officer Discusses Tool Buying

STANDARDIZING on commercial designs, better cost analyzing by users, less "twelfth hour" ordering, budgeted expenditures and purchasing department latitude in bargaining, were given as important factors in securing better and more economical tool purchasing by railroads in an address by D. C. Curtis, chief purchasing officer of the Chicago, Milwaukee, St. Paul & Pacific to the sixteenth annual convention of the American Railway Tool Foremen's Association, held in Chicago, September 12 to 14, inclusive. In addition to the address by Mr. Curtis, the subject of "Car Shop Tools" was presented by P. Kass, superintendent of the car department of the Rock Island, and five committee reports were presented and thoroughly discussed.

At one of the regular sessions the association elected the following officers to guide its activities during the coming year: President, W. R. Millican, tool foreman, Missouri-Kansas-Texas, Parsons, Kan; first vice-president, H. P. Jones, supervisor of tools, Oregon Short Line, Pocatello, Idaho; second vice-president, A. A. Ferguson, supervisor of tools, Missouri Pacific, St. Louis, Mo., and third vice-president, H. L. Taylor, supervisor of shop machinery and tools, Baltimore, & Ohio, Baltimore, Md. G. G. Macina, Chicago, Milwaukee, St. Paul & Pacific, Chicago, was re-elected secretary-treasurer. One new member was elected to the executive committee, W. J. Davidson, tool foreman, Atlantic Coast Line, Waycross, Ga. The other members of the executive committee are: Chairman, J. T. Jones, tool foreman, New York Central, Cleveland, Ohio; E. J. McKernan, supervisor of tools, Atchison, Topeka, & Santa Fe, Topeka, Kan.; J. E. Carroll, supervisor of tools, Chesapeake & Ohio, Huntington, W. Va., and C. A. Shaffer, general supervisor machinery and tools, Illinois Central, Chicago, Ill.

[In this, the first address presented by a railway supply officer to the American Railway Tool Foremen's Association, Mr. Curtis advised against the specially-made tools for railroad use when reasonable co-operation among users and makers would add the benefits of mass manufacture to the production of satisfactory equipment for all purposes, and he particularly expressed a desire to see more co-ordination and understanding between those who order tools on a railroad and those obligated to buy them, as a means of cutting tool costs. The more detailed remarks of Mr. Curtis are presented in part as follows:—EDITOR.]

Individual railway tool rooms do not use sufficient tools to make it profitable for many manufacturers, or even a few competitive manufacturers, to produce special tools. On the other hand, tool users on railroads, with their ingenuity and practical experience and working with the manufacturers, can usually secure commercial designs sufficient to their needs. The tools may then be purchased at a reasonable price, and the benefits of this study by individual tool users extended to others in the railroad field. It pays to discuss the tool problem with the manufacturers, as in many instances they are able to make improvements, both in quality and price, and still furnish a suitable article for the work required.

The tendency in railway tool design is to make tools that will not wear out. This practice is not always sound. A tool should be made so that it will produce a profit for its user. It should be made to last only a reasonable length of time and pay a dividend in that time. Some of the most successful users of tools, particularly in mass production work, build their tools only for a life of five years during which the tools must pay for themselves. This enables the user to take advantage of the improvements that are so rapidly being made, or to discard the tool without loss if conditions change so that it is no longer needed.

There is a tendency, also, to purchase tools for mass production where mass production is not required. Buying a tool for mass production where mass production is not needed, not only increases the cost of the tool, but in most cases, also, increases the cost of the work performed on account of the time necessary to make the changes in the dies, jigs, holders, etc., that are necessary in mass production. The storekeeper of a railroad, when ordering small quantities of material, often hears the complaint that it costs more to change the machine than to perform the work, and the shops ask for a large order so that the work can be done cheaper. It costs at least 15 per cent of the value a year to carry unused material in stock so it becomes important, where the mass production is considered, to be sure that mass production is justified.

Requisitions for tools should give the size, make, design, purpose, material best suited for construction, the estimated cost, the estimated life desired, and the wearing parts that will require replacement. The names of manufacturers of the tool should also be given, but no requisition should insist upon the purchase of one particular make of tool as this prevents competition. The purchasing agent deals with thousands of items, and if he is to protect the railroad, must have the information and be free to deal intelligently with the seller.

The purchasing of tools also requires time. The stockman in a storehouse, handling tools, probably has several thousand other items of material to look after. He must know the quantity of each of these items on hand, the quantity due, the quantity for which he is holding orders from others, and the quantity used during the last ordering period. For each one of these items he must write a requisition and send it to the general storekeeper for checking before it is sent to the purchasing agent. The purchasing agent usually must send out an inquiry with the detailed description of the tool to all the manufacturers or jobbers. The manufacturers and jobbers take several days to prepare their bids, and after the bids are submitted representatives make personal calls, explaining their bids in detail. The entire procedure takes time, and tool users must be forehanded in planning their needs.

Those who order material, also, should know their purchasing agent and have an occasional visit with him. It is much easier to discuss problems across the table

than it is by correspondence, and the user will find that by this acquaintance the purchasing agent is better able to serve the users' interests. A purchasing agent's desire should be to purchase what users want, but he also carries the responsibility of conserving the company's money just as far as possible, and still furnish the article that will do the work required. The purchasing agent must know whether manufacturers are offering a tool made too cheap on the one hand, or too elaborate and high priced on the other, and he needs the co-operation of tool foremen for this purpose.

In too many instances on railroads, operations are based on individual opinions rather than on facts as to their value in dollars and cents to the company. It is essential that users of tools know the cost of their tools, not overlooking the overhead expense, including the cost of the land for the work to be done, the cost of the buildings, taxes, insurance, repairs, obsolescence, interest, the cost of power to drive, etc. It is important to take into consideration all these factors before tools are purchased. The man equipped with this information is protected from embarrasment to himself and is likely to get what he orders.

I am a firm believer in operating on a dollars-and-cents basis, rather than in terms of piece output or performance. The thing that counts is the amount of money in the treasury, and we can only keep money in the treasury by spending it where it produces more than is taken out of the treasury. The dollar sign should be associated with every design and piece of work to be performed. The dollar limitation always forces better tools and cheaper work, as it forces closer supervision.

I am also a firm believer in the budget as a means of controlling the expenditures. If a tool room is given a certain amount of money to spend, the probability is that it will be spent for tools that will give the greatest return to the company and, at the same time, produce the best showing for the individual. A railroad, like an individual, has more requests for expenditures than dollars to spend and must regulate these expenditures to keep within its income.

Requisitions for tools, replacements and repair parts for tools should also be consolidated as much as possible. It is much easier to get a better price on quantities than on individual items. In addition to that, it is possible to get a better product, as the larger the purchase, the more time is spent in purchasing and the greater is the desire of the manufacturer to furnish the most acceptable product. The American manufacturer relies on mass production for profit. Requisitions for similar material should be sent in from all parts of the railroad at one time, monthly, quarterly or bi-yearly, as the needs demand and be submitted by the storekeeper to the purchasing agent in one unit as nearly as possible. This not only enables the purchasing department to benefit by quantity purchases, but makes it worth while for a competent supervisor to go over the order and inspect the tools. It reduces handling and checking in the storehouse and affords an opportunity to substitute new tools for old ones at the points where they will do the most good, and to forward the old tools to the points where their use is less. By this method, it is possible to spend money for tools most advantageously.

The best tool a railroad has is a competent man. If he can be standardized so that his requisitions and his operations are simple, understandable, workable, coherent, economical and progressive, the work will be well done, the department successful and the stability of the road improved.

Western Carriers File Livestock Brief

WESTERN trunk line carriers filed a brief with the Interstate Commerce Commission on September 11, in which four major propositions were advanced to summarize the condition of the live stock industry as developed in the Hoch-Smith Investigation, I. C. C. 1700, Part 9. It is the carriers' position that any general revision of live stock rates in the Western District would require an increase in the western trunk line territory. In the event that a general revision of rates was not acceptable to the interested parties, the traffic committee of the carriers would have no objection to a continuation of the existing basis, provided such basis be increased by not less than 20 per cent. The four propositions are: (1) The present earnings of Western trunk line carriers are insufficient to insure the maintenance of adequate transportation for the future, (2) the livestock traffic fails to participate adequately in producing net railway operating income, (3) economic conditions and price levels in respect to livestock are now extremely good, and (4) the carriers' proposed rate scales in Western trunk line territory are as low as may lawfully be required.

The brief shows that carriers in the Western district, under present rate levels, are not able to earn as much as carriers in the other two districts, nor are they approximating the fair return of 5¾ per cent prescribed by the Interstate Commerce Commission. These facts are demonstrated either by basing the rate of return in the three districts upon the investment accounts of carriers or basing it upon the concept of value employed by U. G. Powell, rate expert of the Nebraska Railway Commission. The following excerpt is quoted from the brief.

"The net railway operating income of Western district carriers in 1926 was $454,051,723. In 1927 this net railway income declined almost fifty million dollars, being in the latter year, $407,881,895. This produced a rate of return for 1927 of only 3.92 per cent, based on the investment accounts, or of 4.54 per cent, based on Mr. Powell's value basis of $8,991,576,843 for December 31, 1925. This latter computation disregards the increase in value during the year 1926.

"The decline in net railway operating income of Western trunk line carriers has not been occasioned by a decline in traffic or by a failure to make necessary improvements to their properties. The freight traffic has increased more on these Western trunk line carriers than it has in the entire Eastern district, although not as great as in the United States, excluding the Western trunk line territory. The Western trunk line carriers have added to their investment in road and equipment. The fact that the addition has not been as great as in the remainder of the United States or in the Eastern district doubtless reflects to some extent the meager present earnings of the Western district trunk line carriers.

"In 1927, of the eight Western trunk line railroads previously designated, only two paid dividends on their common stock. One of these, the Chicago & North Western, in 1920, had been forced to reduce the dividend of 7 per cent which it had paid continuously for twenty years, to 5 per cent, and in January, 1924, this dividend rate was again reduced to 4 per cent. It had also been compelled to reduce the dividend of 8 per cent which it had been paying on its preferred stock for 18 years to 7 per cent in 1920, which was the mini-

mum that it could pay and still continue any dividends on its common stock. The Chicago, St. Paul, Minneapolis & Omaha, after paying dividends on its common stock at five, six and seven per cent continuously for more than a quarter of a century, was forced to discontinue dividend payments altogether in 1923. The dividend on its preferred stock, which it had paid at the stated rate of seven per cent for many years, was reduced to five per cent in 1924. The Chicago, Burlington & Quincy, by reason of its low capitalization in respect to either its investment accounts or its final valuation, has continued to pay dividends of 10 per cent. The net railway operating income of this latter company, however, was only $28,143,000 in 1927, producing a rate of return on its valuation to date of only 4.64 per cent. The standard return of this same carrier as certified by the I. C. C. covering the years 1915 to 1917 was $33,841,541. None of the other carriers enumerated paid any dividends whatsoever and three of them, the Chicago, Milwaukee, St. Paul & Pacific, the Chicago & Alton and the Minneapolis & St. Louis were in default, in whole or in part, upon their bond issues.

"We believe that, due to forces over which they have no control, the Western trunk line carriers are now attempting to do business upon a rate level which is too low to enable them to meet their necessary expenses and to even approximate a fair return on the value of their properties, regardless of the basis on which such value is computed. The reasons which have led to the establishment of this low level are many and varied. Some of them are historical, some economic, and some due to the fact that these carriers have been considered en masse as a part of the entire Western district without regard to the peculiarities of their individual situation.

"Since 1917, $443,305,000 in bonds of Western Trunk Line railroads have been stricken from the list of investments that are legal for savings banks in New York state, while during the same period for all railroads in the remainder of the United States only $6,230,000 of bonds have been stricken. On the other hand, during this same period the par value of bonds added to the legal list in New York state for carriers outside Western Trunk Line territory has aggregated $726,007,000 while no bonds of Western Trunk Line carriers have been added to the list. Something is fundamentally wrong which produces any such result as this."

"On January 1, 1925, livestock in the United States had an inventory value on the farms of $3,145,164,000. On January 1, 1928, the inventory value had increased to $4,178,527,000, an increase of approximately one-third, or of more than one billion dollars, although the number of livestock was appreciably less. Since most of the livestock is located in the Western District, and its movement is largely to the markets in that district, the great increase in value of livestock has inured to the benefit of livestock producers in the West. Gross freight revenue on livestock in the Western District amounts to about $75,000,000 annually. The increase in inventory value in livestock has been many times the total freight charges which have been paid.

"Not only do the returns from operation disclose the fact that Western District carriers as a whole are now failing to earn a return sufficient from the standpoint of the public interest, but the record demonstrates beyond possibility of contradiction that the Western Trunk Line carriers are earning even less—in fact they are receiving the lowest return of any group of carriers in the whole United States. In 1927, Western Trunk Line carriers earned a return of only 3.02 per cent upon their property investment."

"Among other problems which these carriers have faced and are now facing, is the increase in wage levels which has been forced upon them. Wages constitute one of the major items of operating expenses. The total operating expenses of all class I carriers in 1926 were $4,669,336,736, of which $2,946,114,354 was for the compensation of employees. Wages were thus 63.1 per cent of all operating expenses.

"The Railroad Labor Board, which was created by the Transportation Act of 1920, advanced rates of pay in May, 1920, to the extent of approximately $618,000,000 for all railroads in the United States. In 1921 and 1922 the Railroad Labor Board reduced these wages and these reductions were given consideration by the I. C. C. when it reduced the rates on grain, grain products and hay in the Western district. In the decision reducing these freight rates the I. C. C. stated that wages had been reduced approximately 12 per cent and that such reduction would produce a saving to the carriers of the United States of $425,000,000 per year, of which $160,000,000 would accrue in the Western district. Similarly, when the I. C. C. required the 10 per cent reduction in freight rates in 1922, it again gave consideration to the reductions in wages as made by the Railroad Labor Board.

"In the year 1924 the train and engine service employees of the Western railroads, together with similar employees on railroads in other districts, secured a restoration of approximately one-half of the reduction in wages which had been made by the Railroad Labor Board in 1921. The amount of this increase was not less than $16,000,000 annually, as computed by applying five per cent to the compensation of train, engine and yard employees shown in the statistical abstract of the I. C. C. for 1923. The Railroad Labor Board was abolished in 1926 by an Act of Congress, known as the Railway Labor Act, approved May 20, 1926. Under the processes of this latter act wages on the Western railroads have been materially advanced. During the year 1926 increase in wages were made, which, on an annual basis, aggregated $6,054,894 for the Western district railroads. During the year 1927 further advances in wages were made, which, on an annual basis, aggregated $16,091,675. In January, 1928, further advances aggregating $855,035, on an annual basis, were made effective.

"Since the hearings in this investigation have closed the Circuit Court of Appeals for the Seventh Circuit in a proceeding entitled, Atchison, Topeka & Santa Fe Ry. Co. et al. vs. Brotherhood of Locomotive Firemen and Enginemen, by decision dated May 24, 1928, has sustained a decision of a Board of Arbitration under the Railway Labor Act in respect to the wages of firemen on Western district railroads, which will further increase the payrolls of these railroads in the annual amount of $3,643,404. The Western district railroads also face pending wage demands of conductors, trainmen and yard service employees in the amount of $22,898,639 annually and of engineers in the amount of $10,335,624 annually. Of the total amount of $23,011,804 annually, which had accrued prior to March 1, 1928, (thus excluding the firemen's award), $5,722,635 applied on the eight Western trunk line carriers. In other words, approximately 25 per cent of the total increase in wages under the Railway Labor Act had to be paid by those Western trunk line carriers. In addition to this, these carriers are at present faced with wage demands of other employees."

Insolvency of Pension Plans and Remedies*

New York Central lines make progress in building pension reserve fund

By Frank V. Whiting

Chairman, Board of Pensions, New York Central Lines

IT has been frequently and truthfully asserted in the past few years that pension plans were adopted in this country without a realization of the large sums ultimately required to meet future obligations. Inferentially, it is quite common to excuse the failure to place pension plans on a sound financial basis by alleging ignorance as to ultimate cost and we manifest a well simulated surprise when told that a large majority of industrial pension plans are insolvent. No doubt some of you will say that many plans would have been organized on a proper financial basis if their sponsors had been cognizant of the cost at the time of adoption. Perhaps so, yet I venture the opinion that with such knowledge many a plan surviving at present would have "died abornin".

It should be understood that what we have to say in connection with this subject does not include state or other government pensions for the aged, but relates only to what we commonly term industrial pension plans.

The National Industrial Conference Board, Inc. in its 1925 publication—"Industrial Pensions in the United States"—reports that "under one particular plan studied, the expense, according to careful calculation, would reach its maximum no less than 57 years after its establishment. The expense would then be 78 times as high as for the first year, and seven times as high as for the tenth year of the operation of the plan."

Few Plans on Sound Financial Basis

Most plans were adopted without knowledge as to the ultimate cost. Today there are but few plans that can be said to be upon a securely sound financial basis. The pension payroll has been and is in many quarters regarded as an auxiliary to the active payroll—when the active payroll increases production is enhanced and presumably the earnings are increased. However, the inevitable increase in the number of pensioners and payments brings about no corresponding increase in revenue but on the contrary corrals many a newly earned dollar to pay for a responsibility created out of service of many years past, the funds for which could have been provided during the working life of the employee, or by funding the liability at the time pensions were granted.

It is obvious that where no provision has been made for accumulating funds to pay potential pensions and, in all instances where pensions are granted and payments made from current earnings, such plans are financially unsound. The prevailing practice of meeting current payments out of current earnings, in effect, mortgages future profits to discharge prior liabilities and eventually the result must be insolvency.

The paramount question, so little considered at the inception of practically all the present plans, is that of properly funding a plan so that it will not come to grief through lack of adequate protection and security.

The Industrial Relations Section of Princeton University reports that in 1925, out of 248 pension plans, 220 were non-contributory—in other words, where the funds were furnished entirely by the industry. While, so far as the New York Central Lines is concerned, we are dealing wholly with a non-contributory plan, there are a number of contributory plans that are on a financially sound basis and the plan of the New York Stock Exchange and that of the Western Clock Company, which are reinsured, are outstanding typical plans of this nature.

New York Central Pension Plan

The New York Central Lines pension plan was adopted in 1910 and has been modified from time to time, considerably affecting results in later years. From 1910 to 1927, inclusive, 9,009 pensions were granted at an average age of 67.32; average years of service 33.70; average annual amount of pension $450.24. The average annual pension in 1910 was $275; this increased to $748.56 in 1927. The estimated cost of the capital or matured liability of all grants was $36,083,425. The average capital liability per pensioner in 1910 was $2,068, and for the year 1927 was $6,798. Capital liability is ascertained by multiplying the annual pension by the life expectancy of the pensioner. The total amount disbursed during the 18 years was $16,913,140. There were 4,701 deaths of pensioners to December 31, 1927, leaving 4,308 survivors at that time.

As an illustration of the constantly increasing cost of pensions, in 1910, when our plan was adopted, the amount paid was $289,590. In 1919, the tenth year, total disbursements were $767,135, increasing steadily in the following eight years until 1927 when the disbursements amounted to $2,330,364. One of the most pregnant statements that can be made indicating the constantly increasing burden is that in 1910 there was paid to the pensioners of that year $289,590, and that from 1910 to 1927, inclusive, there was paid on pensions granted in 1910, solely, $2,429,942—this without reference to grants subsequently made. In the year 1927 survivors who were pensioned in 1910 were paid $27,790. As of December 31, 1927, there were approximately 6½ per cent of the 1910 pensioners surviving; 16 per cent from 1911; 32 per cent from 1917 and 45 per cent from 1919. The National Industrial Conference Board reports the disbursements for pensions during the year 1924

*From an address at the Eleventh Annual Conference on Human Relations in Industry, Silver Bay, N. Y., August 29, 1928.

by 163 concerns amounting to $18,192,250, making an average per concern of $111,609. The New York Central Lines' disbursements that year exceeded this average thirteen-fold.

Ideal Method of Financing

We consider that the ideal method of financing pension payments, beginning with the establishment of a pension system, is (1) to make an appropriate provision to take up accrued liability by reason of past service, and (2) to set aside or accrue annually from the revenues as earned during the working life of an employee, a sum representing the amount, which, with compound interest, will be sufficient to meet potential grants, the purpose and effect being to accumulate funds during the working life of an employee for his ultimate pension, analogous to current charges for depreciation on property.

It seemed obvious to us, however, that a definite forward step in the direction of reforming the customary practice and one fairly approaching the ideal method would be to meet the liability arising at the time a pension is granted on a present worth basis, either by contributions to a fund or by setting up a reserve to cover such liability. The following shows the operation of this plan in principle on the New York Central Lines from the date of its adoption, January 1, 1925, to June 30, 1928:

During the years 1925, '26, '27 and the first half of 1928 the gross worth of the capital or matured liability on pensions granted was $14,977,319. During these three and one-half years disbursements on grants made during the period amounted to $2,831,596, leaving a balance in the pension reserve as of June 30, 1928, of $12,145,723, which sum is available to pay out to termination the grants made during this period.

As has been well said, there are two specific methods by which an employer can provide a safe financial basis on which to secure the payment of pensions. The first is termed the "reinsured pension plan," the second "the self-insured plan."

Reinsured Pension Plans

Several insurance companies during the past few years have been offering annuities on a group basis adaptable to use by industrial concerns for the payment of pensions. Such annuities may be grouped, however, in one of the following three general plans or a modification or combination of these plans.

(1) Annuities purchased for eligible employees at the time of their retirement, payment for such annuities being made on a single premium basis at the time of retirement. Of course, the amount required is higher than for other forms owing to the fact that no payments have been made during the employee's service and hence no opportunity to accumulate compound interest. The argument is advanced that it is best to purchase annuities in this manner since the sums which would otherwise be paid for premiums are allowed to remain in the business where possibly the returns are greater than compound interest.

(2) A single premium deferred annuity, under which plan a small annuity is purchased to cover each employee for each year of his service.

(3) A level premium deferred annuity, which means that the premium remains constant. A level premium plan is generally used for employees' contributions in reinsured contributory plans. It is apparent that on a reinsured plan the actuarial risk is transferred to the insurance company.

In view of the accrued liability by reason of service rendered prior to adoption of a plan, a reasonable solution would be to purchase annuities on a single premium basis from an insurance company as employees are retired where the circumstances warrant such action.

Obviously, large concerns can meet the situation fairly by the self-insurance method—that is, they can contribute to a fund the present value, actuarially ascertained, of the liability incurred at the time pensions are granted, which, with compound interest, will provide sufficient to pay the pensions to termination. It is feasible, either through the purchase of deferred annuities or contributions to a fund, spread over a period of 30 to 40 years, to provide sufficient money to take up the total of the accrued liability by reason of past service. Of course, it is a comparatively simple matter to provide for new employees by setting aside funds for them during their working life.

Without calling attention to the various factors affecting the sufficiency of contributions in connection with pension funding, we recognize the necessity of an actuarial revaluation from time to time.

Attention is called to an amendment to the insurance law of the State of New York, effective April 19, 1926, Chapter 501, Article 6-B, entitled, "Retirement Systems and Pensions," under which a corporation may form a corporation referred to as the "retirement system" for the purpose of providing benefits on account of members retired by reason of age, disability and/or length of service and for other purposes. This is in effect a private insurance company.

The transportation companies of this country are in a different situation in some respects than industries generally for the reason that in the classification of operating expenses the railroads must follow the rulings of the Interstate Commerce Commission. With reference to pension trusts, the railroads in principle are practically confronted with a situation identical with that of industries.

One of the important factors confronting all industries with pension plans, especially with reserves or separate funds, is that of being permitted to deduct such contributions from gross income as "ordinary and necessary business expense." Under regulation 69 of the Revenue Act of 1926, Art. 109, Pensions, "The amount paid for pensions to retired employees are proper deductions as ordinary and necessary expenses. No deduction shall be made for contributions to a pension fund held by the corporation, the amount deductible in such case being the amount actually paid to the employee xxx."

Under Office Decision 110 of February, 1919, Treasury Department Bureau of Internal Revenue, Cumulative Bulletin No. 1, April-December, 1919, Income Tax Rulings, Section 234, Article 562: Donations, "Donations by a corporation to a pension fund for the benefit of its officers and employees, the fund being organized entirely separate and distinct from the corporation, having its own set of books, making its own investments, and paying its own expenses, legal title of which does not remain in the corporation, are deemed to be donations to a charitable institution conducted for the benefit of the corporation's employees or their dependents, representing a consideration for a benefit flowing directly to the corporation as an incident of its business, and are allowable deductions from gross income in determining net income subject to tax."

"Amounts paid into a fund during each year for pensioning its employes are deductible from gross income for the year as ordinary and necessary expenses of carrying on the petitioner's business, where the facts and circumstances connected with the creation and operation of the fund show that it is a trust and a separate taxable entity." Hibbard, Spencer, Bartlett and Company v. Commissioner of Internal Revenue, U. S. Board of Tax Appeals, November 12, 1926."

The twenty-second annual report for the year 1927 of the president and treasurer of the Carnegie Foundation for the Advancement of Teaching in an article, in which the foregoing decision is quoted, states as follows:

"The suggestion has been offered that although the principles of the Revenue Act of 1926 have not been changed, their application in certain directions is proving more liberal than was anticipated. Certainly some concerns which purchase from life insurance companies group annuity contracts for employes are deducting the concern's deposits as 'ordinary and necessary business expense, and thus only when the pension or the retiring annuity purchased by the employes' contributions and accumulations begins to be paid to the retired employes are those payments taxable."

Attention is called to Sections 165 and 166 of the Revenue Act of 1928, the first dealing with employes' trusts, and the second with revocable trusts, these Sections reading as follows:

"Sec. 165. Employes' Trusts: A trust created by an employer as a part of a stock bonus, pension, or profit-sharing plan for the exclusive benefit of some or all of his employes, to which contributions are made by such employer, or employes, or both, for the purpose of distributing to such employes the earnings and principal of the fund accumulated by the trust in accordance with such plan, shall not be taxable under section 161, but the amount contributed to such fund by the employer and all earnings of such fund shall be taxed to the distributee in the year in which distributed or made available to him. Such distributees shall for the purpose of the normal tax be allowed as credits against net income such part of the amount so distributed or made available as represents the items of dividends and interest specified in section 25 (a) and (b).

"Sec. 166. Revocable Trusts: Where the grantor of a trust has, at any time during the taxable year, either alone or in conjunction with any person not a beneficiary of the trust, the power to revest in himself title to any part of the corpus of the trust, then the income of such part of the trust for such taxable year shall be included in computing the net income of the grantor."

Incidentally these same sections are in the Revenue Act of 1926.

Section 23-Q of the Revenue Act of 1928 reads as follows:

"Pension trusts.—An employer establishing or maintaining a pension trust to provide for the payment of reasonable pensions to his employes (if such trust is exempt from tax under section 165, relating to trusts created for the exclusive benefit of employes) shall be allowed as a deduction (in addition to the contributions to such trust during the taxable year to cover the pension liability accruing during the year, allowed as a deduction under subsection (a) of this section) a reasonable amount transferred or paid into such trust during the taxable year in excess of such contributions, but only if such amount (1) has not theretofore been allowable as a deduction, and (2) is apportioned in equal parts over a period of ten consecutive years beginning with the year in which the transfer or payment is made.

It is clear that under the rulings of the Revenue Bureau contributions to a pension reserve, where the industry retains legal title to the fund, unless the same be impressed with a trust, are *not* deductible from gross income and it necessarily follows, in order to secure the benefits of such deduction, there must be an expressed or implied trust under which title to the fund would at least in equity be relinquished by the settlor. In the Hibbard, Spencer, Bartlett & Company case, referred to in the foregoing, the United States Board of Tax Appeals held in substance that its pension fund was an implied trust and that it was immaterial whether the company retained possession of the fund or placed it in the hands of the pension committee. Of course, the amendment to the Act of 1928 gives the right to create a pension trust and to deduct the amount of contributions from gross income, the earnings and principal of such fund not being subject to income tax until paid to the employe.

From the above it necessarily follows that when Hibbard, Spencer, Bartlett & Company created the trust it forfeited legal title to the fund as long as the trust was alive, and directly gave a contractual right to enforce the pension payments.

Admittedly, section 23-Q is somewhat involved, but as this paper deals principally with the proper funding of a pension plan, it seems unnecessary to discuss this feature.

While we realize that the question of whether pension funds may be deducted from gross income is an incidental feature of the general subject of proper funding, yet it is apparent that the solution of that question will indicate to employers generally that where practicable pension funding can be accomplished on a more economical basis under present conditons by either the purchase of annuities or trusteeing of pension funds rather than by setting up a reserve or a pension fund legal title to which is retained by the employer.

General Foremen Meet at Chicago

THE twenty-second annual convention of the International Railway General Foremen's Association was held at the Hotel Sherman, Chicago, September 18 to 21, inclusive. During the four-day session, addresses were made by A. G. Pack, chief inspector, Bureau of Locomotive Inspection, Interstate Commerce Commission; U. K. Hall, general supervisor of stores, Union Pacific System; W. G. Black, mechanical assistant to the president, Erie; W. E. Dunham, superintendent car department, Chicago & North Western and R. V. Wright, editor, Railway Mechanical Engineer. With the exception of the opening session, the remaining six sessions were devoted to specific topics, on each of which committee reports were presented and discussed, as follows: Reduction of Federal Defects; The General Foreman's Responsibility for Inactive Stocks; How to Improve Personnel Relations; The General Foreman's Contribution to Long Runs; How to Get More Car Miles per Car Day, and Passenger and Freight Car Repair Classification.

The president, F. M. A'Hearn (B. & L. E.), in his opening address, traced the development of modern motive power, particularly in relation to its great increase in size and complexity, as compared with units of only a few years ago and, in speaking of the added responsibility which this imposes on the general foreman, said in part:

"In the future, as in the past, the general foreman's responsibilities will be possibly not the greatest of the transportation industry, but among the most important. To live up to our motto 'For the improvement of the service of all the railroads' is an object worthy of our best efforts. The improvement of the service has a two-fold object and both main issues must ever be kept in mind. The purpose of the railroad is to furnish transportation for our population and to transport our people and their goods safely and speedily to their destinations. In providing this transportation, our efforts must be directed in such a manner as to insure our employers, the railroad stockholders, an adequate return on the funds invested in our transportation systems.

The general foreman is the trustee in both of those missions. Upon him depends the safe operating condition of the 60,000 steam locomotives on America's railroads today, as well as the 2,000,000 cars which must be so conditioned as to supply America's now frequent demand for more than a million weekly car loadings.

The same gratifying results are not in evidence in the earning powers of the railway systems. The average

return of 4.47 per cent on property investment shown in the year 1927 is far below what is expected and earned by capital invested in other industries. To do our part in securing a better return for the money expended in the providing of transportation is a goal worthy of our best efforts. Conservation of fuel, avoidance of damage claims, more careful supervision in the matter of repair materials, a higher standard of workmanship, and the further developed use of labor-saving appliances are among the means which may be used to show increased return for the railway dollar expended.

"Our purpose here today, then, is to discuss frankly the many problems which now confront us, and to anticipate, as far as it is possible, our problems of years to come."

Mr. Pack, in an address on the subject of Federal Defects cited the fundamental requirements of the law and referred to court decisions in defining what constitutes a federal defect on a locomotive. He said that the elimination of such defects is a most important subject for discussion, because it is the only means by which the maximum degree of safety, reliability and efficiency in performance may be obtained. He pointed out that "many major factors, all of which are important, are concerned in the elimination or reduction of defects on locomotives. The highest degree of success," he said, "can be attained only through the co-operation of the designer, builder, the industries that furnish the materials and those that furnish the various appurtenances and appliances which make our modern locomotives so efficient, and the carrier's maintenance forces in the back shop and the enginehouse. However, the results required of the maintenance forces demand continuous, never-ceasing effort. Prevention is the first requisite in the orderly process of reduction or elimination of defects, and assuming that the builder and associated agencies have done their part, this must start in the back shop. . . . So long as a locomotive is to be continued in use, it should be turned out after each general repair with unimpaired ability to handle its full tonnage on schedule time." Summing up his address, Mr. Pack said: "It is a recognized principle of all successful production methods that thorough inspection of each component part, and of the assembled unit, is essential in the control of quality and I have therefore emphasized inspection, before and after applying repairs, as a prime requisite in the process of eliminating defects.

"Many mechanical officers do not take advantage of the opportunity afforded by the daily inspection reports to keep informed of the sufficiency and durability of repairs made from trip to trip. We too often find the same defects repeatedly reported, with evidence that repairs had been attempted each time reported. This should be ample evidence that the methods of repair were not effective, that progress was not being made in the elimination of these defects, and that time and money were being wasted.

"Many of the larger roads have adopted what is commonly termed the periodic repair system. This consists of a thorough repair job at times of monthly or annual inspections required by the law and rules, putting the locomotive in condition to run to the next monthly inspection and repair period with a minimum of mechanical attention. I am of the opinion that this periodic method of making inspections and repairs is the best system yet devised for putting locomotives in condition so as to obtain the maximum freedom from defects, maximum daily mileage, and maximum reliability in service, at a minimum of cost.

"Co-operation is the keynote of success, therefore we should not neglect the personal element, because success in any undertaking depends largely upon human relations. Good will and mutual confidence are paramount. We all do our best work under the stimulus of encouragement and approval of the people for whom we are working. The example set by those in charge goes far in producing success in any undertaking. Leadership, teaching and training, with sincere efforts to advance the legitimate interests and happiness of those whom we supervise, are more essential to success than elaborate organization or modern shop facilities, desirable as these may be."

Election of Officers

The following officers were elected to serve during the year 1927-28: President, J. H. Armstrong, Atchison, Topeka & Sante Fe; first vice-president, H. B. Sunderman, Hocking Valley; second vice-president, Arthur H. Keys, Baltimore & Ohio; third vice-president, C. Y. Thomas, Kansas City Southern, and fourth vice-president, C. M. Hillman, Minneapolis & St. Louis.

* * * *

On the C. & O. at Kenova, W. Va.

Railroad-Owned Air Line Proposed

Air transport seen as imminent com petitor unless railroads adopt it as an ally—Specific plan critically considered

By C. W. Kelsey

[*Editor's Note.—The author of this article has devoted many months of study to aviation and its probable effect on the railroads. In the course of his investigations he has come into contact with many persons prominent in aviation, railroading and in government. As a result of this study, he has arrived at a definite plan for railroads as regards air transportation and this plan he sets forth here with the reasons underlying his advocacy of it. In publishing this article the* RAILWAY AGE *does so with the sole idea of making public an interesting viewpoint upon a subject of great importance to its readers. We have formed no opinion, pro or con, regarding Mr. Kelsey's specific recommendations.*]

IN considering the importance of aviation the first things for the railroads to decide are: Will aviation in the near future affect their business and, if so, how, when and to what extent? If these questions can be answered with reasonable assurance, then what the railroads should do regarding aviation is simply a matter of careful planning to meet the new conditions ahead of them.

High Points in Aviation Development

In order to answer these questions, let us first glance briefly at some of the high points of aviation from its beginning up to the present time.

1903.—Twenty-five years ago the Wright brothers made their first flight in a heavier-than-air machine. The duration of this flight was a matter of seconds, and the maximum speed obtained was not in excess of 35 miles an hour. The machine could not start itself and had to be catapulted off a runway. Its maximum load was its pilot. At that time only a small group of people believed that the Wright brothers had actually flown. Generally the rumors of this flight were discredited.

1906.—Santos Dumont made the first official flight in Europe in a heavier-than-air machine, leaving the ground for 36 ft. flying at a velocity of 23 m.p.h. Later in the same year Santos Dumont travelled 700 ft. in 21 seconds, and won several prizes offered by the French Aero Club.

1908.—The world was startled by the news that Bleriot had flown across the English channel from Baraques to Dover, 21 miles.

1910.—Curtis made a non-stop flight from Albany to Governor's Island flying over the Hudson river, a distance of 135.4 mi. in 2 hr. 32 min.

1912.—It was not until 1912 that the United States was crossed by airplane, and then only because the pilot had unsurpassed patience and perseverence in continually making repairs and rebuilding his ship. It took him 151 days from Jacksonville, Fla., to San Francisco.

1914.—By this time speeds up to 75 m.p.h. had been achieved and many endurance records running into hours had been made. With the war came a concentration of engineering ability on airplane development, which did much for it.

1919.—Brown and Alcok successfully cross the Atlantic, covering the 1960 miles from Newfoundland to Clifton, Ireland, without a stop. Remarkable as this flight was, it was generally regarded only as a sporting stunt and did little to stimulate aviation, which for the next eight years went through its most trying period and was only kept going by the indomitable will and courage of a comparatively small group. Wright, Lewis, Martin, Coffin, Keyes, Curtis, Stout, Farman, Sikorsky, Ryan, Young, Boeing, Douglas, Loening, Fokker and Junkers are among the perhaps not more than two dozen active executives who brought aviation through the doldrums.

1927.—On May 2, 1927, the entire world was thrilled to the achievement of Lindbergh's New York to Paris flight, 3,610 mi. in 33½ hr. at an average of 108 m.p.h., carrying a load of 3,144 lb. in gasoline, oil, pilot and miscellaneous. The apparent ease with which this trip was made, together with Lindbergh's gracious personality had the immediate effect of jogging the world into the realization that aviation is with us, a reality to be dealt with.

1928.—Today we have records of duration in the air of over 65 hr. for airplanes with motors and of over 14 hr. for airplanes (gliders) without motors; of speed attained of 318 m.p.h.; of crossing the United States from the Pacific to the Atlantic in 19 hr.; of all oceans having been crossed; and of all corners of the civilized world being in intercommunication by airplane. Transport planes carrying 20 passengers are in successful daily use; the daily mileage of commercial planes in the United States alone is probably in excess of 30,000 miles, and several commercial lines now operating are making profits.

The improvement in safety has been so marked that a very high ratio of freedom from accidents per mile flown has been obtained by the regularly established commercial airways. Practically all fatal accidents that are now occurring are due to recklessness, stunts, undisciplined pilots, obsolete equipment, or overcongested airports.

Forty-Passenger Planes Possible

Responsible aeronautical engineers of the highest authority state that 40-passenger planes that will be superior to any transport planes now in use can be had just as soon as they are demanded.

This brief review of the past and present indicates that the airplane today is something that cannot be ignored by any companies in the transportation business. What of the future? It seems safe to assume that the progress which has been made and is now being made in safety, reliability, durability, capacity and efficiency is not going to stop and that we can look forward to improvements in all of these.

In considering the future it must be borne in mind that engineers work only with known quantities. They are limited as to their future outlook by present facts. Fifty years ago it was safe to say that no engineer in his wildest dreams could conceive of wire-spoked wheels revolving on ball-bearings, shod with balloon tires, carrying over our highways at 40, 60, 70 m.p.h. a sub-

stantial part of our population. Once a new device has proved its practicability and a demand exists for it, it invariably goes far beyond the dreams of its inventor. In the last thirty years this has been true of steel buildings, concrete construction, telephones, automobiles, phonographs, steamships, refinement of metals, gasoline motors, electric power, radio, railroads, etc.

Because of this it can be concluded with reasonable assurance that the airplane will not be an exception; that it will be improved in all probability as much as was the single cylinder, unreliable, smoky, dirty, vibrating, chain-driven, noisy automobiles of 1900—the difference being, however, that because of our increasing speed of progress the improvements on the airplane will come much faster.

Is Passenger Air Transport Practical?

What does all this mean to the railroads? No railroad executive wants to spend his company's money on unproved future prospects. He must foresee a proper return on every dollar invested. Because of this logical and practical necessity, let us see what could be done today with the most improved type of commercial transports now available if operated over regular airways, equipped with the most modern devices, and under management such as railroad organizations can supply. Let us see what could be done now with what we have at hand, without any regard as to what the future may hold.

Following figures give the expected performance of passenger transport planes now under construction by one of the oldest, most experienced and most reliable builders. The company manufacturing these planes will accept orders for them under a bond of performance, and the standing of this company is such that any railroad would accept this bond. There are other companies that can do as well. I am not trying to sell these ships and I have no connection with this company or any other manufacturer. I only call attention to the fact that ships capable of real competition in passenger service are now available.

PERFORMANCE PROMISED

H. P. 2400. Equipped with 4 motors, max. speed 130 m.p.h. Cruising speed at 3000 ft. 103 m.p.h. Landing speed, 62 m.p.h. Ceiling 13,750 ft. Crew 4 men. Fuel for 1000 miles. Pay-load 8250 lbs.

Suggests Railroads Join in Forming Air Transport Company

Let us assume a properly financed, well-managed railroad-controlled air service, in which a number of railroads are interested, participating railroads owning controlling interest in the air company and assuming responsibility for its management. Let us assume that this company should begin operations with a single line between New York and Los Angeles by the way of St. Louis. Also assume that this company should take advantage of every available means for securing the safety and comfort of its passengers and the reliability of its service, even to controlling its own airports, thus doing away with the danger of landing in congested public ports; that this company should make the best use of railroad discipline and build up an esprit de corps equal to that on the railroads and also that this company's publicity department see to it that the public's confidence is built up relying on the public confidence in the standing and responsibility of the railroads interested in this jointly-controlled air line. This air line would have to have a name—something like "Railways Air Service Company," let us say.

Adjacent hereto is given a time table showing rates at 8 cents a mile, the approximate distance between stops, ports where emergency planes might be carried, ports where planes and passengers might change, night-flying areas, etc.

	Approximate Miles	Fare	Depart	Arrive	Plane Mileage	Stop for	Emergency Planes
New York	000		8:00 a.m.				2 spares
Philadelphia	100	$8.00	9:15 a.m.	9:00 a.m.	No. 1 Plane 600 miles	15 min.	
Pittsburgh	250	$20.00	12 noon	11:45 a.m.		15 min.	1 spare
Columbus	160	$12.80	1:55 p.m.	1:36 p.m.		19 min.	
Cincinnati	90	$7.20	3:50 p.m.	2:49 p.m.		61 min.	1 spare
St. Louis	300	$24.00	7:30 p.m.	6:50 p.m.	No. 2 550	0 min.	
Kansas City	250	$20.00	11:00 p.m.	10:00 p.m.		50 min.	2 spares
Topeka	130	$10.40	12:45 a.m.	12:18 a.m.	No. 3 480	27 min.	
Wichita	100	$8.00	2:00 a.m.	1:45 a.m.		15 min.	
Hansford	250	$20.00	5:30 a.m.	4:30 a.m.		60 min.	1 spare
Albuquerque	230	$18.40	8:00 a.m.	7:48 a.m.	No. 4 530	12 min.	
Williams	300	$24.00	12 noon	11:00 a.m.		60 min.	1 spare
Ludlow	200	$16.00	2:30 p.m.	2:00 p.m.	No. 5 310	30 min.	
Los Angeles	110	$8.80		3:36 p.m.			2 spares
Totals	2470	$197.60		31' 36"			

This table has been worked out so that at no time would the planes have to travel faster than their cruising speed. Passengers would change planes five times in making a transcontinental crossing. This would be done for safety's sake, so that no plane would ever be overburdened, six hours of flying per day being the maximum duration of continuous operation. This would provide ample time for thorough inspection and tuning up for its return journey the next day, over the same course and with the same crew. Emergency planes would be kept at numerous ports along the route. Each plane would have as a crew one pilot, one assistant pilot, who would also be a radio operator, and one porter who would be also an emergency radio operator.

New York to Los Angeles In 31½ Hours, Regular Schedule

From the proposed schedule shown in the table it will be noted that it would be possible to leave New York at 8 a. m., and be in Los Angeles the following day at 3:36 p. m., actual time, (no allowance made for difference in time), at a cost to the passenger of $197.60, plus meals. If we assume that these ships would run three-quarters full, or 30 paying passengers per trip, and we should operate only one ship each way each day, we should receive a total revenue per day of $11,856. To have this line properly equipped 20 ships should be in service, including those held for emergency use.

It is presumptuous at this time to give detailed figures as to operating costs, overhead, fixed charges, etc. I have figured this out many different ways and I think I have taken in every conceivable expense, including fixed charges, insurance, taxes, depreciation, etc., and I am willing to go on record in saying that a line operating over such a route under the conditions that I have named, making stops to take on and off passengers at the fourteen cities shown in the table, and making only one trip a day each way, would not only make expenses and pay all interest charges on airports, equipment, etc., but would show a satisfactory net return on the total investment at the end of a year's operation.

If I am right and only one trip a day each way would pay these expenses, what would happen when overhead expenses are prorated over ten such trips

each way a day, which is a reasonable expectation to be reached within the next five years?

Passenger aviation can be made to pay now. I make this statement unhesitatingly and only after a careful study of the facts. If an 8-cent fare is established and a 32-hour regular schedule is maintained between New York and Los Angeles, a new class of long distance travelers should be developed. Thousands of people with sufficient means have nevertheless either never been in distant parts or travel rarely because of the time element. Such persons should be attracted to ride because time is not a serious obstacle in airplane travel. A week's vacation would give a person on either coast practically five days for visiting and sightseeing on the opposite coast, whereas under present arrangements almost the entire week would be spent in travel. People from all over the country would use the railroads to get to the nearest airport on such a trans-continental air line. The railroads would be the feeders to this air line. In a vast majority of cases the passengers would be originated on the railroads and, because of this, the railroads should control and operate the airways.

Foresees Railroads as Freight and Express Carriers Exclusively

No one can say what the future holds for aviation; however, with 40-passenger ships a certainty, it is time now for the railroads to act. Every improvement is going to better the situation for air travel. I believe that these improvements will be such that within the next thirty years all passenger travel for distances, other than commutation, will be made more economically, more advantageously and as safely by air as by rail. If I am right in this it means that within thirty years the railroads, except for commutation service, will become exclusively freight and express carriers. And there should be for many railroads an advantage in this—especially so, if the passenger revenue can be replaced by profits earned through part ownership in a Railways Air Service.

Forty-passenger planes can carry a sufficient number of passengers to cut materially the dwindling passenger traffic now carried by the railways. And a further loss of traffic might reduce the profits of handling what remained down to the vanishing point.

Four hundred or four thousand passengers a day each way could readily be accommodated on a line such as is suggested between New York and Los Angeles, by a simple increase in the number of planes and personnel. Airport facilities properly laid out to handle one plane a day each way, would readily handle 100. A large part of travel of this kind would naturally be made up of service between intermediate points.

Airplanes Good Only in Fair Weather?

Railroad men quite generally believe in the future of aviation, yet they often suggest that airplanes are only fair weather carriers. To some extent they are justified in this belief, but the same conditions that will tie up aviation may delay trains and steamships, and after wash-outs, blizzards and hurricanes, airplanes can immediately proceed without any interference, while days may intervene before rail or highway service becomes normal.

In commercial practice today aviation is comparatively safe, and developments now being made will in all probability make it possible for airships to fly absolutely blindly so far as visibility is concerned. Under these conditions planes will be able to land accurately and safely at their destinations without being able to see the ports due to fog, snow or driving rain.

Different methods are being tried out to accomplish these results. Satisfactory progress along these lines is being made. It is confidently expected that a ship equipped for blind flying will have an instrument which will show the pilot when he is approaching a field, when he is directly over it, and his elevation. Fog-penetrating lights will lead him to the exact spot to land.

In very bad weather—and it will have to be bad enough to tie up ordinary shipping—airplanes will not start out. Planes in flight will be continually informed by radio of weather conditions, so that in an emergency they can land at an emergency port. Snow and ice on their wings will not be a problem, as this will be dissipated before it forms.

Railroad men should not hesitate regarding aviation because of the question of safety and should not let the fatal accidents of stunt fliers and hair-brained notoriety seekers influence them.

Some Existing Lines Have Excellent Records for Safety

As an example of what has been, and is being done, by the better organized and better managed companies in the matter of safety, the Imperial Airways, Ltd., of Great Britain offers a splendid example. This company's operations extend to principal British points of interest going into Persia, India, Egypt, etc. The London-Paris route is the best known. The company is now contemplating extending service to South Africa and Australia.

In the last three years this company's planes have traveled over 2½ million miles without a single injury of any kind to any passenger. The 56,000 passengers carried is a very small number in comparison with railroads. However, with the 40-passenger planes now possible the number of passengers that can be carried under the same safe circumstances could readily be brought up to a comparable figure.

Another record for safety is that of the Italian company known as the Transadriatica. This line runs from Rome to Venice and Vienna, and was recently extended to Berlin. It operates daily excepting during the winter months, when it operates only three days a week. In going over the Alps its planes have to fly at an altitude of over 13,000 ft. This company in its two years of operation has had no injury to passengers and the regularity of service is given as 98 per cent, which takes in the winter as well as the summer travel.

In the United States the only passenger service operated as foreign lines are operated, was that of the Philadelphia Rapid Transit Company during the Sesqui-centennial Exposition in Philadelphia. This line operated between Philadelphia, Washington and Norfolk. During the five months of its operation 3,695 passengers were carried and 93,770 miles flown with a regularity of approximately 90 per cent. During this period of operation there was no failure of any kind with motor or plane, and there was no accident of any kind to any passenger nor even a complaint from a single passenger.

The Ford passenger service between Detroit and Cleveland, which is comparatively new, has had no fatal accidents to any passengers to date.

These records show that when air service is properly conducted it is already surprisingly safe at any time of the year. With this record of safety and the danger

element daily becoming less, railroads can confidently count on air service under their management being as safe as their service on the rails.

Railroads Have Three Courses Open

With aviation here, active competition in sight and the future prospects for aviation promising what should the railroads do about it? They have the choice of:

1. Paying no attention to aviation.
2. Making aviation a part of their present company, starting their own independent lines or affiliating with some line already in existence.
3. A number or all of them affiliating together on some equitable plan of ownership and management in a unified air service under their joint control.

Considering these points one by one we have:

1. From present indications it is evident that few railroads or navigation companies are going to completely ignore aviation. Some of them have already indicated an active interest in it.

2. Those railroads or navigation companies which start their own separate companies, or make aviation a part of their present system, or who affiliate with companies now already in existence, must go into it on a large enough and thorough enough scale to assure the best possible service for their patrons. Anything short of the best and safest available will be a reflection on the subscribing railroad. Whether or not a single railroad at this time is justified in such an investment, is a question in the minds of many railroad officers.

3. A number of railroads and navigation companies joining together under one management and control presents a number of advantages, and, in my personal opinion, offers the logical, most profitable and only satisfactory solution of this problem. To enumerate:

1. The first of these advantages is the securing of desirable airports under most favorable terms, which ports are bound to increase in value and importance.

2. Would relieve each railroad or navigation company from all legal responsibility after their passengers are transferred to the air line, the air company assuming all responsibility.

3. Minimum cash outlay on the part of affiliating railroad companies in securing the best obtainable air service.

4. Would place each subscribing railroad in position to sell to any passengers that demand air service the best air service obtainable—at a profit to the railroads and at reasonable rates to their customers.

5. Acting as feeders to the Railways Air Service, the railroads would obtain passengers they otherwise would not have.

6. Share in profits of Railways Air Service.

7. Voice in management.

8. Assurance that if air service increases at loss to railroad passenger business, the loss will be offset by profits realized through railroad interest in the Railways Air Service.

9. Advertising and publicity.

The essentials of a jointly-owned railroad air company—the "Railways Air Service"—are that it should be of sufficient size and financial strength to own and control its own airports, modern planes and equipment, obtain the service of the best available engineers, pilots, executive officers, etc. Any railroad that is not in receivership should have an opportunity to become affiliated with such a company on a basis that would be equitable and fair to all concerned. The control of this company could be held by the affiliating railroad through stock ownership. This stock could be paid for in a measure by contracts between the railroads and the Railways Air Service, which would contemplate that the subscribing railroad agree:

A. To route all its air traffic over the lines of the Railways Air Service wherever possible.

B. To arrange to sell Railways Air Service tickets from all the established ticket offices and to post Railways Air Service schedules and advertisements in prominent display positions in all of the railway stations.

C. To cooperate and in general help to build up the business of the Railways Air Service.

On its part the Railways Air Service should agree:—

1. To establish as quickly as practicable scheduled air services with the most modern planes, equipped with most modern devices.

2. To operate its airports and airways and have them equipped with modern equipment for safety and comfort of passengers.

3. To make all contracting railroads agents for the sale of tickets over its routes.

4. To supply sufficient air service to take care of all reasonable demands.

5. Within three years to have in operation not less than two trans-continental routes, one Atlantic coast route in operation, one Pacific coast route in operation and two North and South mid-continent routes.

6. To route all air passengers going to points beyond airports over the shortest and most satisfactory route afforded by contracting railroads.

7. To establish wherever possible and practicable, its airports adjacent to participating railroad lines.

8. To mention names of participating railroads in its advertising and publicity from time to time.

9. To co-operate with participating railroads for their benefit.

A jointly-owned railroad air service ought to mean:

1. Responsibility.
2. Comfortable, safe and reliable planes operated on regular schedule.
3. Well-equipped and well-managed airports located in advantageous positions.
4. Properly trained and disciplined pilots and operators.
5. Engineers of the highest standing.
6. Co-ordination with rail and navigation schedules.
7. Reasonable fares.
8. Placing aviation on a higher business basis and creating thousands of new flying passengers because of the public's faith in railroad management.

Such a unified Railways Air Service would undoubtedly serve the best interest of the public, and as such a company would greatly stimulate aviation, it would be to the best interests of manufacturers of airplanes, equipment, etc. It should help the business of airlines now in existence and it should be in position to co-operate with those that are properly managed and equipped.

SCENERY CARS—Baggage cars, 70 ft. long to carry theatrical properties, have come to be an important feature of railroad operation, the Pennsylvania having lately built 45 new cars of this type; and "Edwin Booth," "Robin Hood" and "Jenny Lind" et al. are to become familiar names in the railroad world, all of the 45 cars being named after leading actors, singers, etc. New express cars, 74 ft. long, designed especially for carrying horses, are also being put in service by the Pennsylvania, 25 of them, and these will be named after leading race tracks of the country, "Havre de Grace," "Lincoln Field," "Jefferson Park," and so on. Scenery cars have end doors so as to take in the longest pieces, and the horse cars have end doors to make it convenient to load the automobiles of the trainers and jockeys.

Signal Section Concludes Busy Convention

Highway crossing protection among important subjects discussed at closing session of three-day meeting at Atlantic City

THE report of the business handled at the first two days' sessions of the stated meeting of the Signal Section, A.R.A., at Atlantic City, September 11, 12, and 13, was given in the *Railway Age* of September 15, page 500. The feature of the program on the last day was the report of the Special Committee on Highway Crossing Protection, which included an explanation of the development of automatic crossing protection and an argument against the use of "traffic signals" at grade crossings. A. H. Rudd (Penn.), chairman of the committee, made several changes in the report in order to include the latest information. The more important portions of the report follow:

Report on Development of Highway Crossing Protection

An interesting development in highway crossing protection is the introduction, by at least one railroad, of a short track circuit on sidings which cross highways within the limits of the automatic signal protection and where signals are operated by trains on the main track. This circuit extends through the highway crossing and a sufficient distance on each side to insure proper clearance of the highway when a train is cut to admit the passing of highway travel. On most railroads the movements of these trains over the highway are protected by a flagman, but the circuit is installed for the purpose of operating the signals so that vehicles on the highway will not run into the side of the train which may be standing or moving over the crossing after having had such movement preceded by a flag.

Hours of Watchmen May be Adjusted to Train Schedules

The committee suggested that, in many cases, when train schedules are changed, additional protection may be afforded at crossings protected by watchmen by adjusting the hours of duty to correspond. If such change is made and signs are posted showing the hours the watchmen are on duty, care should be taken that similar change is made in these signs.

The committee was advised that some railroads think the 20 sec. limit for operation of the signal by an approaching train is too short and that this time should be lengthened. Attention is called to the fact that this time is specified as the minimum required and that local conditions will always govern.

Use of Traffic Signals at Grade Crossings

The use of "traffic signals" at grade crossings was discussed at the meeting of the American Railway Engineering Association last March, and the unanimous vote of those in attendance at the meeting was against the display of a green light on a highway crossing signal.

The Model Municipal Traffic Ordinance, prepared by the committee on municipal traffic ordinances and regulations of the National Conference on Street and Highway Safety, provides as follows:

(a) Green or "Go"—Traffic facing the signal may proceed, except that vehicular traffic shall yield the right of way to pedestrians and vehicles lawfully within a crosswalk or the intersection at the time such signal was exhibited.

(b) Yellow or "Caution" (or "Wait") when shown following the green or "Go"—Traffic facing the signal shall stop before entering the intersection, unless so close to the intersection that a stop cannot be made in safety.

(c) Red or "Stop"—Traffic facing the signal shall stop before entering the intersection and remain standing until green or "Go" is shown alone.

Whenever traffic at an intersection is alternately directed to proceed and to stop by the use of signals exhibiting green and red lights or the words "Go" and "Stop" and without a definite time interval between such signals, said lights and terms shall indicate as follows:

(a) Green or "Go" (same as (a) above).

(b) Red or "Stop"—No waiting traffic facing the signal shall proceed until the green or "Go" signal is displayed, and moving traffic facing the signal shall stop before entering the intersection and remain standing until the green or "Go" signal is displayed, except that in the event an approaching vehicle is so close to the intersection at the time the red or "Stop" signal first appears that such vehicle cannot stop with safety, then it may proceed.

Mr. Rudd explained here that it should be noted that a steady burning red traffic light means "stop and stay."

On streets where traffic at intersections is controlled by traffic control signals or by police officers, pedestrians shall not cross a roadway against a red or "Stop" signal, and shall not cross at any place except in a marked or unmarked crosswalk. A pedestrian crossing or starting across in any such crosswalk on a green or "Go" signal shall have the right of way over all vehicles, including those making turns, until such pedestrian has reached the opposite curb or a safety zone, and it shall be unlawful for the operator of any vehicle to fail to yield the right of way to any such pedestrian.

Mr. Rudd explained at this point that it should be noted that under this section a steady burning green light gives the pedestrian absolute right of way over all vehicles.

The Uniform Vehicle Code of the National Conference on Street and Highway Safety, which has been adopted by 14 states and is about to be adopted by many others, provides that:

Whenever any person driving a vehicle or street car approaches a highway and steam or interurban railway grade crossing, and a clearly visible and positive signal gives warning of the immediate approach of a railway train or car, it shall be unlawful for the driver of the vehicle or street car to fail to bring the vehicle to a complete stop before traversing such grade crossing.

The Model Municipal Traffic Ordinance may be obtained from C. W. Stark, secretary, Committee on Municipal Traffic Ordinances and Regulations, National Conference on Street and Highway Safety, Department of Commerce, Washington, D. C. A standard system of signs recently recommended by the American Engineering Council, was prepared by a committee appointed by that body at the request of the National Conference on Street and Highway Safety. This standard system is in harmony with the standards for rural highways adopted jointly by the American Association of State Highway Officials and the U. S. Bureau of Public Roads. The

committee's report can be obtained from the American Engineering Council, Washington, D. C.

Mr. Rudd then read, from the report mentioned, the rules on railroad crossings, train approach signals, crossings and gates. He explained that the committee of the American Engineering Council is attempting to establish the principle, as indicated above, that a steady burning red light at crossings and intersections indicates stop and stay; a flashing light gives warning and, when red, requires a stop, after which the vehicle may proceed if the way is clear. The committee also advocates the general principle that all warning lights shall be yellow.

From the foregoing, it will be seen that the principle is recognized, first, that there is a distinction between these "Stop and Stay" signals and a signal giving warning of ends of streets or places where vehicles shall slow down, and second, a distinct difference between these "Stop and Warning" signals and signals indicating the approach of a train.

The signal recommended by the Signal Section, American Railway Association has also been made standard by the American Railway Engineering Association, the American Association of State Highway Officials and the American Engineering Council. It has been accepted by the National Conference on Street and Highway Safety in its endorsement of the proposed standards of the American Engineering Council and has been made the American Standard by the American Engineering Standards Committee.

Standard Signal is Distinctive

This standard signal is distinctive and used for only one purpose. It is more arrestive to the eye than a steady burning light. A movement is well under way to instruct crossing watchmen on duty at night to swing their lamps horizontally across the highway if a train is approaching, and thereby further educate the public to the idea that the appearance of a swinging light indicates the approach of a train. It is proper that a steady burning red light should be used on lowered highway crossing gates because they indicate stop and stay until the gates are raised.

There are many conditions at crossings protected by automatic signals where it is allowable for vehicles to pass after stopping and ascertaining these conditions, and where, if they remained until the signals changed, would seriously congest highway traffic. A "Stop and Stay" signal might not only congest traffic, but cultivate a disregard for the signal.

A railroad has no authority to enforce the observance of this "Stop and Stay" indication, and should not provide it unless required by state law or by authorities having jurisdiction. Its duty ends when it indicates the approach of a train and the standard signal conforms to the principles enunciated by the Hoover conference.

We are advised that it is surprising to find, in the defense of personal injury law suits, how many people there are who cannot distinguish colors, and, even if they can distinguish them, are confused in mistaking one for another. This difficulty is so apparent to the authorities of many municipalities that they have not only put up the colored light signals, but have also put up semaphores, so that the traveler cannot escape responsibility by saying that he mistook one color for another. The A.R.A. highway crossing signal eliminates this danger.

A green light would be an invitation to cross the railroad track. This is its function in general highway traffic and at street intersections. The courts have placed upon the driver the responsibility of seeing that the way is clear. A green light is an invitation to cross; in fact, with the ordinary traffic signal, it is a command to proceed. Any exhibition of a green signal by the railroad is an invitation to cross. and such invitation places the responsibility on the railroad instead of on the driver.

Many states require that the speed of a vehicle be reduced when approaching a steam railroad crossing, and, in some cases, require a stop. Experience has shown that, when a green traffic light is shown, drivers of vehicles speed up in order to pass it before it changes, and if used at railroad crossings, it would doubtless have the same effect and encourage violation of the speed laws.

Therefore, it would appear that the only places where traffic signals might be used is where they are constantly policed by the municipal authorities, and in such cases, it is recommended that the signal be caused to display a red light by the approach of a train or action of the crossing watchman, and after the passage of the train, the apparatus be restored so that the municipal authorities can give the proceed signal if they so desire.

Any general adoption of this traffic signal would destroy the uniformity which we are all attempting to obtain, and as before stated, tend to the disregard of the stop signal, which disregard is in evidence now, where traffic signals are not policed, or where it is seen that the officer is absent.

The expense of installing these signals would be less than the standard signal, but the cost of maintenance and operation with commercial current would be considerably more, and with battery current would be prohibitive, and the use of such a signal at some crossings and our standard signal at others, possibly at adjacent crossings or on the same highway where several railroads are crossed, one of which has power available and the next one not, would further tend to confuse conditions.

For these reasons, the committee is of the opinion that the use of the ordinary traffic signal is inadvisable at highway grade crossings, although considerable pressure has been and will be brought to bear to adopt such a signal, especially within city limits.

Summary of Recent Action By State Commissions Presented

The Committee also presented a summary covering recent action taken by state commissions. The only report of special interest is that, the Railroad and Warehouse Commission of Minnesota has standardized on the so-called Griswold signal, which consists of the alternately flashing red lights, A.R.A. standard, supplemented by the standard octagonal yellow sign with "stop" in black letters displayed between them when a train is approaching, and turned edgeways to highway traffic after the train has passed.

Mr. Rudd presented a co-operative report with the American Engineering Standards Committee on colors for traffic signals, stating that the report of the Committee on Standard Code for Street Traffic Signs, Signals, and Markings of the American Engineering Council had been issued August 1, 1928. Mr. Rudd stated that: "As the American Engineering Council Committee has already recommended the railroad standard crossbuck and approach sign, the marking of crossing gates, and automatic signals indicating the approach of a train.

and as the latter has already been adopted as the American standard, it would appear that whatever action this committee takes as the Sectional Committee of the American Engineering Standards Committee, it will not affect any of our railroad signs or signals, except possibly the stop sign."

Other Reports of Importance

An interesting development in signal and interlocking construction is the use of parkway cable for underground circuits. The committee on Overhead and Underground Lines, G. H. Dryden, (B. & O.) chairman, presented a new specification for parkway cable as well as a specification for signal wire insulated with mineral matter and rubber compound.

The Committee on Signaling Practice, of which W. M. Post, (Penna.) is chairman, presented a report on signal indications, aspects and names, in which it was pointed out that on March 13, 1928, representatives of this committee and the Committee on Operating Rules, Operating Division, A. R. A., held a joint meeting and agreed on names, indications and aspects for the new Standard Code. The indications and aspects were the same as submitted as Exhibit "A" at the 1928 annual meeting. (See page 560-D24 of the *Railway Age* for March 6, 1928.) The names were the same except that the word "Speed" was removed from "Approach Medium Speed, Clear Medium Speed, Clear Slow Speed and Approach Slow Speed." The arrangement was changed so that, starting with "Clear Signal," Rule 281, the signals follow consecutively as they impose restrictions.

It was decided that the following would be shown under definitions:

Medium Speed— ..... miles per hour.
Slow Speed— ..... miles per hour.
Restricted Speed—Proceed prepared to stop short of train, obstruction, or anything that may require the speed of a train to be reduced.

It is expected that each railroad will show the miles per hour for medium and slow speeds.

The definitions, names, indications and aspects agreed upon have been included in the Block Signal and Interlocking Rules of the Standard Code of the American Railway Association, which have been printed and distributed among the railroads.

The Committee on Contracts, G. E. Beck (N. Y. C.) chairman, presented a revised list of interlocking units and values, and a new table of units and factors for signaling equipment other than interlocking. This committee cooperated with a committee of the American Railway Engineering Association in drawing up an agreement for joint interlocking plants, which was adopted by the A. R. E. A.

The Committee on Interlocking, E. T. Ambach, (B. & O.) chairman, presented a report including seven revised specifications, one revised drawing, a report on the use of steel-taped cable in place of wood trunking, and a report on methods of keeping interlocked switches free from snow and ice.

The Committee on Instructions, of which A. Vallee (D. & H.) is now chairman, has been working for several years on the preparation of a book for the education of new men entering the field, as well as for training men now employed so that they may become more familiar with the apparatus used. Several chapters of the book have already been printed, and the committee presented three more chapters for approval, as well as a portion of a list of definitions of technical terms used in signaling.

Briefs in W. & L. E. Anti-Trust Case

WASHINGTON, D. C.

COUNSEL for the Interstate Commerce Commission, in their brief filed with the commission in connection with its complaint against the Baltimore & Ohio, New York Central and New York, Chicago & St. Louis for alleged violation of the Clayton anti-trust act, take the position that an order should be issued requiring the B. & O. and N. Y. C. to divest themselves of their stock in the Wheeling & Lake Erie but that the Nickel Plate is in a different situation because less competitive with the Wheeling.

The commission should find, says the brief by Thomas P. Healy and William H. Bonneville, counsel for the commission, that the effect of the acquisition of the stock by the first two named companies may be to substantially lessen competition and to restrain commerce, in violation of Section 7 of the act, and "there can be no doubt that the acquisitions by the New York Central and Baltimore & Ohio come squarely within the provisions of the act." They also say, however, that "it seems very doubtful if the effect of the acquisition of the stock of the Wheeling by the Nickel Plate may result in a substantial lessening of competition between the two carriers."

The three trunk lines have filed briefs urging dismissal of the complaint, on the ground that there has been no showing of any substantial lessening of competition, and the Pittsburgh & West Virginia, intervenor, has filed a brief asking an order directed against each of the three trunk lines.

After asserting that the three trunk lines, owning 51 per cent of the stock and having been represented by 12 of the 15 members of the board of directors of the Wheeling since May, 1926, "have control of the Wheeling & Lake Erie," the brief says that their showing in the record that competition has not been lessened since they gained control does not relieve them of the inhibitions of the Clayton act, nor indicate what may happen in the future.

"It is to be expected that these respondents would be prudent enough to exercise their control in a manner which would put them in the best light during the pendency of these proceedings," the brief says. "Their officers have testified that they will not stifle or interfere with the traffic of the Wheeling & Lake Erie nor lessen its competitive situation. However, the future is uncertain, and so far as possible the law has not left such matters to the intentions of men. Experience has shown that power in the hands of men will be abused, and, as stated by the commission in Unification of Southwestern Lines: 'However worthy of trust the persons now seeking to acquire this control may be, their successors may not be so worthy.'

At another point in the brief counsel say that the purpose of the Clayton act is to prevent rather than cure. "By the Sherman Act," they continue, "monopolies are declared unlawful and may be dissolved after competition has been eliminated and the injury and damage have been done; the Clayton act prevents monopolization and aims to maintain competition. With practically 50 per cent of the Wheeling & Lake Erie traffic competitive with the Baltimore & Ohio, and approximately 30 per cent competitive with the New York Central, the competitive traffic between the Wheeling and each of those two carriers is more than

sufficient to bring it within the purview of the Clayton act . . . Of the three respondents the Nickel Plate undoubtedly is in the most favorable situation from the geographical and traffic standpoints. The relatively small percentage (13 per cent) of the Wheeling & Lake Erie traffic which is competitive with the Nickel Plate by a one-line haul is due to the geographical location of those two lines, which makes them complementary and supplementary to each other rather than competitive."

Attitude of B. & O.

The Baltimore & Ohio in its brief takes the position that Section 7 of the Clayton act "does not function nor may it be used to correct a supposed violation of a provision of the transportation act" and that it does not forbid the mere acquisition of the shares of stock in the absence of any showing that competition has been lessened. "No presumption may be indulged," the brief says, "merely from the fact of stock acquisition, that substantial lessening of competition or restraint of commerce in any section or community will result. No lessening of competition or restraint of commerce has been shown as a result of the stock purchase. Competition between the Wheeling & Lake Erie and the Baltimore & Ohio has increased since the purchase of the shares of the capital stock of the former by the latter. No intent to lessen competition or restrain commerce has been shown. No circumstances have been disclosed to warrant a finding that the effect of the stock purchase may be to suppress competition or restrain commerce . . . The complaint charges nothing more than 'mere sweeping conclusions in the language of the statute,' and the record does not supply the infirmity in the complaint."

P. & W. V. Position

The Pittsburgh & West Virginia brief requests that the commission find each of the respondents guilty of violating Section 7 of the act and require each of them effectually to dispose of their holdings of Wheeling stock, under supervision of the commission, "to the end that the law may not be circumvented," and that the offices of directors chosen by the votes of the stock be declared vacant.

The Nickel Plate's brief asserts that it has not used its Wheeling stock, by voting or otherwise, to bring about or in attempting to bring about any lessening of competition. Reciting that the Baltimore & Ohio and the New York Central each acquired substantially the same amount of stock at approximately the same cost and at about the same time, the Nickel Plate insists in its brief that "no lessening of the Wheeling's competition has occurred or been attempted or even suggested by any representative of the Nickel Plate or of either of the other trunk lines. There is not, and never has been," the brief states, "any agreement or understanding between the trunk lines to control the Wheeling, to dictate or interfere with its policy or vote in any particular manner, for any purpose, any Wheeling stock."

Furtherance of the four-system plan is referred to by the Nickel Plate as "among the purposes which led each of the trunk lines to purchase its Wheeling stock." Discussing this aspect of the transaction, the brief states:

"Had the plan been fully carried out, the Wheeling would be held intact, be operated independently and continue to serve, as it has in the past, the interests of all its connections. The Nickel Plate joined with the Baltimore & Ohio and the Central in recommending the adoption of the plan to the Commission and is, therefore, committed to it as a matter of good faith. Formal submission to the Commission is contemplated."

New York Central Brief

The New York Central submits in its brief that "the competitive relationships existing between the Wheeling, the New York Central, the Nickel Plate, the Baltimore & Ohio, the Pennsylvania and the Erie are such as to make it manifestly absurd and preposterous to assume that the New York Central System can conceive it to be to the financial interest of that system to undertake a policy of suppression of Wheeling competition, even assuming, another manifest absurdity, that it could secure the cooperation in such a policy of the other carriers involved.

"It is impossible to find in this record any evidence whatever of an actual intent to stifle competition. It is impossible to find any facts which suggest such an intent. All that we have are the clamorous charges of the intervening Pittsburgh & West Virginia, whose witnesses speculated, surmised and conjectured that there must be such an intent lurking somewhere in the transaction which at some later time will become manifest. These speculations, surmises and conjectures are based upon the fact that the New York Central owns 17 per cent of the capital stock of the Wheeling, the Baltimore & Ohio a similar amount, the Nickel Plate a similar amount, upon the further mathematical proposition that the addition of these three amounts produces a sum slightly in excess of 50 per cent of the capital stock of the Wheeling and upon the further fact that in the event of the adoption by the Commission of a final plan of consolidation of the railroads of the United States, the three companies have recommended to the Commission a tripartite ownership for the Wheeling. From these facts it is inferred that it must be intended by the purchasers to suppress competition and that such must be the effect of their acquisitions. A greater hiatus between premise and conclusion could hardly be imagined."

The Security Holders' Committees for A Fair Return, saying they represent the holders of $635,000 of bonds and a substantial amount of stock of western trunk line railroads, filed a brief saying that "if the present trend of earnings in relation to interest charges is not corrected by proper rate revision, additional bankruptcies in western trunk line territory are inevitable." After referring to the commission's statements in its decision in the 5 per cent case, the brief says: "The deficiencies in revenue and the inadequacy of return pointed out by the Commission in that case have not altered since those findings were made save in one vital respect: The two years' experience since July, 1926, has served to confirm and prove to the most optimistic that the serious financial position of these carriers is a persistent and continuing condition. The situation has thus become stabilized but the stabilization is on a basis of less than 3½ per cent of the commission's own valuation of the investment. . . . Unless the intent of the transportation act is to be vitiated; unless the transportation act is to be nullified in respect of a substantial portion of the railroad mileage of the country, western trunk line territory must have immediate substantial rate increases, including the entire increase in live stock rates proposed by the respondents herein."

British Railways Authorized to Operate on Highways

Parliament votes extension of charter powers against active opposition —Railways win public support by widespread presentation of facts

By Alfred W. Arthurton
British Railway Companies' Association

THE granting of the Royal Assent to bills recently passed by the British Parliament conferring authority upon the British railways to operate highway vehicles in common carrier service marks a new phase in the relationship of the railways to the roads. The railway proposals to operate highway services, now authorized but not yet definitely announced, aroused great interest throughout the country and for many months the matter was hotly debated in the press. By an overwhelming majority in the House of Commons the bills were referred to a joint committee of both Houses of Parliament and an inquiry lasting 37 days took place.

Opposition Was Monumental

Never within long memory has there been so monumental an opposition to private bills as was mustered in this case. Never before can an opposition have been so completely and painstakingly sifted to the very core. Through a seeming endless mass of arguments and evidence, much of it purely legal, the committee dealt both thoroughly and sympathetically with every aspect of the question brought before its notice and the tributes paid by counsel at the final sitting to the fair and patient manner in which the committee conducted the long inquiry were well deserved. Six King's Counsel, led by H. P. Macmillan, who was Lord Advocate for Scotland in the Labor government of 1924, among them piloted the railway bills to victory, and nearly thirty counsel unsuccessfully obstructed the path to the desired goal. The whole contest was worthy of comparison with the Homeric combats of the early days of railways.

Why the Railways Needed Added Charter Powers

The disabilities of railway companies in the matter of highway transport were not due to any reason of policy or expediency, but arose from purely technical causes. The highly developed system of roads in Great Britain is a public asset enjoyed by every individual and every commercial enterprise. Anyone is free to put a vehicle on the King's highway and operate it as he wishes, provided that it complies with regulations as to axle-weight, speed, etc., and pays the prescribed tax. Railway companies, however, as statutory corporations, were an important exception to this rule and were not permitted to do what everyone else could do. They were created by Parliament to provide transport facilities and their activities are limited by the provisions of their charters of incorporation. While not actually forbidden to engage in road transport, they were not permitted to employ their capital in enterprises which were not included among the purposes for which they were incorporated, this provision of the law being designed to prevent the directors of a company engaging in outside activities and using for that purpose funds which were subscribed by their shareholders for a different purpose. The only object of this restriction was to protect the interests of the shareholders. Doubtless if mechanical road transport had been in existence when the various railway incorporation acts were passed, authority to engage in road transport would automatically have been included. In existing circumstances, however, it was necessary for Parliamentary sanction to be obtained by the railway companies for any extension of their activities.

Collection and Delivery Privilege Are Of Long Standing

From time to time, since original incorporation, as the changing circumstances and development of transportation rendered necessary or desirable, railway companies have sought and obtained from Parliament addition to their powers. Among these have been authority to own and operate steamboat services, hotels, etc. Another such activity of railways, outside actual conveyance of passengers and freight by rail, is the collection and delivery of freight. From very early days the performance of this service by the railways on the highways has been recognized without express legislative sanction. There was, however, a limit to this power of road transport, in that goods so collected or delivered either had already to have been conveyed by rail or had to be intended for such conveyance.

The position was considered by the railways to be in the highest degree anomalous. As taxpayers and owners of motor vehicles they were the largest individual contributors to the cost of road construction and maintenance, but were not allowed to use the roads for through transportation, while everyone else, including their competitors, might do so freely. If, however, freight had been conveyed a mile or more upon the railway it might be carried 10 miles by the railway company upon the road. Passengers who had traveled or intended to travel by train might be taken from or brought to the station by railway motor coaches from outlying districts, but the railway companies were not legally entitled to convey a patron who wished to ride in a railway motor coach from one village to another, for example.

Present Transportation Upheaval Like That of Early Railway Days

The remarkable industrial development of Great Britain in the 19th century was due in no small measure to the invention of the steam locomotive and to the spread of railway communication throughout the country. The last 20 years, however, has seen the greatest revolution in transportation that has taken place since the introduction of railways. The invention and development of the internal combustion engine and its ap-

plication to highway vehicles turned the roads into highways of commerce but trebled their cost. In 1913 the cost of constructing and maintaining roads throughout the Kingdom was about 17½ millions sterling, today it is well over 50 millions. Larger and more costly vehicles are being continually devised and the standard of road construction and maintenance and consequent cost are constantly being raised. It is mainly owing to the requirements of motor transport that highway construction at such heavy cost is being undertaken throughout the country and the higher the efficiency of the public roads the greater the stimulus to road transport.

Motor Transport Competition— Railways No Longer Monopolies

The growth of motor transport in Great Britain has been remarkable, but it has not yet reached its maximum development. The number of motor trucks is 275,000, as compared with 85,000 in 1914, while there are 99,000 taxicabs and motor coaches. The railways have seen their so-called "monopoly" gradually disappear, although the statutory regulations and restrictions which accompanied the "monopoly" still remain. They have seen the cream of their traffic transferred to the road, their short-distance passenger business considerably reduced and their long distance services threatened. In a recent application before the Railway Rates Tribunal it was stated on behalf of the railways that of the Lancashire cotton traffic which formerly moved entirely by rail and amounted to about 1,000,000 tons annually more than 80 per cent now goes by road. The loss of passenger traffic in certain directions has been exceptionally heavy, but the full effect of the loss has perhaps been masked by the general growth of traffic.

Conditions Held to Be Inequitable

The railways contended in their application to Parliament that existing conditions of highway competition were inequitable, since, while the whole economic cost of providing railway service is borne by the industry itself, the greater part of the cost in the case of their competitors is borne by public funds, to which the railway companies are the largest individual contributors. In support of this it was pointed out that capital totaling 900 millions sterling had to be expended by the railways in purchasing land and constructing lines and stations and that the maintenance of this permanent way costs 14 millions sterling per annum and signaling another 9 millions a year. The railways also have to pay what is known as railway passenger duty, a tax surviving from stage coach days, which costs £400,000 a year. In addition railways have to pay local taxes assessed on profits earned. They are also under statutory obligation to provide facilities for and accept all kinds of traffic and are under close government surveillance in regard to the rates they charge, the wages they pay, hours of duty, etc. On the other hand, when highway transport companies commenced operations they found 175,000 miles of road already provided them without cost. In the maintenance and improvement of those highways the vehicles using them pay only about one-third of the cost, the remaining two-thirds, representing some 30 millions sterling, being paid by the general public in taxes. As against the railway companies' cost of signaling, highway transport companies have the services of the police to control traffic and they do not pay passenger duty nor are they assessed on profits.

The railways are under the closest surveillance by government departments in regard to their methods of operation and safety and they operate under labor conditions more favorable to their employees, both as to hours and wages, than any other industry. Highway transport operators, it was affirmed, are entirely free from all these handicaps and, as a consequence, while serious inroads are being made upon railway revenues highway transport undertakings are making handsome profits. They are under no obligation to accept all traffic offered nor are they under control in the matter of remuneration or the hours of labor of their employees. Highway transport, therefore, as compared with the railways was, it was contended, free and untrammeled.

The Railway Case

In view of these many disabilities the railways decided to seek full road powers in an endeavor to secure equality of treatment with other highway users. Highway competition is totally unlike anything they have had to meet hitherto, but they are fully alive to the necessity of taking counter measures and also of adapting their methods to meet the changing requirements of the shipping and traveling public. The public interest is the prime consideration and this, it was urged, is bound up with that of the railways. The Railways Act, 1921, is designed to secure to the railway companies a certain standard revenue. If in any given year the revenue exceeds that standard, 80 per cent of the surplus is to be returned to the public in the shape of reduced rates and fares, and 20 per cent is to be retained by the companies as an inducement to the provision of further surpluses. If, on the other hand, the standard revenue is not obtained in a given year, the remedy provided in the Act is to increase rates and charges. The loss occasioned by the wholesale transfer of traffic from the railway must, if continued, inevitably result in higher rail charges for the traffic which remains on the railway. This is mainly low-rated and heavy traffic which must necessarily be carried by rail, such as coal, iron, steel and other basic materials, upon a cheap supply of which the main industries of the country principally depend.

Further, the maintenance of the adequate earnings is essential if additional capital is to be available for the purpose of developing and improving the railways to serve modern requirements. An impoverished railway industry cannot provide an efficient and satisfactory service. Railway development frequently involves the expenditure of capital upon which no return is expected for some years while the traffic is developing. Unless railways are maintained in a reasonable state of prosperity they cannot embark on this form of enterprise. Fair and equitable conditions of road and rail competition are, therefore, matters of vital concern to the public which must continue to rely mainly upon the railway system for their transport requirements.

The business of railways is to provide transportation. They have accumulated experience of the transport needs of shippers and the public and have an elaborate organization with expert staffs engaged in supplying those needs. They alone, penetrating to every part of the country, are able to carry consignments of any size, shape or weight from any one place to any other in the

Kingdom. The public therefore should have the advantage of this organization in providing highway transport as well as rail transport so that co-ordinated railway and road facilities may represent the lowest economic cost to the country as a whole. Transport whether by rail or by road is one and the same business and the public should have the fullest facilities for using either method separately or both in conjunction.

A Large Mass of Competitive Traffic

For certain classes of traffic road haulage has undoubted advantages, while for other traffic, such as coal and heavy minerals, road transport is not possible. There is also a large mass of traffic for which rail or road transport is equally convenient and for which keen competition exists. If the usefulness of motor transport is to be developed to its full capacity and the maximum benefit obtained by the public and trade of the country, there should be the fullest measure of co-operation and co-ordination between rail and road transport. It is significant that the World Motor Transport Congress held in London last autumn unanimously passed a resolution that co-operation between rail and motor transport is in the interests of both modes of transport and the public. In this connection it may be stated that provision was made in the bills for entering into operating and traffic agreements with independent road transport operators and that is a development which should and will be a clear national gain.

Previous Attempts to Secure Road Powers

It is not generally known that railway companies were among the pioneers in highway passenger transport. As far back as 1904, and before the motor coach, or "bus," was seen on the London streets, the Great Western Railway ran passenger motor vehicles in certain parts of the area served by its system. These were mainly development services in sparsely populated districts. Subsequently statutory powers were obtained by several of the smaller railway companies now included in the four grouped companies for the purpose of operating motor vehicle services in certain areas. On the whole, however, these highway services in pre-war days were not of great importance. Post-war developments in road transport caused the railway companies to view mechanical road haulage in a new light and when the Railways Act of 1921 was being drafted they sought the inclusion of a clause that would give them the necessary powers to operate road services where they desired. The Speaker of the House, however, ruled that the scope of the measure then before the House of Commons would not permit of the conferring of new powers on railways and that the clause was one that would require separate legislation.

In the meantime a departmental committee was set up by the Minister of Transport in January, 1921, under the chairmanship of the late J. H. Balfour-Browne "to inquire and report whether it is desirable that the railway companies should have general or limited powers to carry by road and if so, what, if any conditions should be attached to the exercise of this power." The committee, however, failed to reach a unanimous conclusion and three separate and divergent reports were issued. The chairman and two railway representatives advocated the granting of restricted powers to the railway companies and considered that the resources of legislation were capable of securing a fair competition between road and railway carriers by road without permitting a combination which would result in injury to the public or a monopoly injurious to the trades which carry or are connected with road transport. A second report by four members representing highway carriers, the Federation of British Industries and the Association of British Chambers of Commerce recommended that any extension of the powers of railway companies in the direction of road transport should be refused. In the third report, signed by the representative of the transport and vehicle workers' unions, it was stated that a complete solution of the traffic problems is only possible by national ownership of all means of transport. He recommended that road powers should not be granted, though for purely development purposes in agricultural or other sparsely populated areas permission might be granted for the purpose of the railways inaugurating "test services."

Bill was Promoted in 1922

In the session of 1922 a bill was promoted by the old London & North Western and Midland companies for the purpose of obtaining powers to carry merchandise by road. The second reading of that bill was carried after full debate in the House of Commons and a select committee was appointed to consider the application. Circumstances, however, arose in connection with the question of charges which caused the railway companies to withdraw the bill, but it is worthy of note that the select committee made a special report to the House in which the following passage occurs:

> The case for the petitioners was not fully before the committee but, subject to the possibility of eliminating unfair competition, the committee is unanimously of opinion that it would be in the public interest to allow the fullest possible participation by the railway companies of this group, and all competitors, in the service of road transport.

The amalgamation of over a hundred separate railway companies into four grouped companies, brought about by the Railways Act, and the long inquiry before the Railway Rates Tribunal regarding standard revenues and standard charges, coupled with reorganization and the difficulties of bad trade and labor troubles, prevented the revival of the question of road transport powers until this year.

Opposition to the Bills Overcome By Publicity

A striking feature of the passage of the Bills through Parliament was the ineffective opposition which they evoked. To the principle of the application and the justice of the companies' claim to the use of the roads in the same way as everyone else, there was indeed no question; and the sole object of opposing organizations was apparently to obtain what restrictions or safeguards they could. The huge majority on the second reading in the House of Commons (379 to 43). and also on the third reading, correctly represented public opinion, which during the last year or so has gradually veered round from a rooted objection to granting the companies further powers of any kind to an expressed desire to remove the restrictions which were hampering the development of the railways. This change of view was attributed by their opponents to a skilful publicity campaign launched by the railways for the purpose of educating the public on the matter through the columns of the press.

The suggestion that the railway companies were aiming at obtaining a monopoly of road transport in Great

Britain, of which so much was heard before and during the Parliamentary inquiry, was easily shown to be impossible of attainment and the public, which stands to gain in facilities and convenience by the granting of road powers to the railways, never shared the fears of monopoly and misuse which opponents of the bills, on somewhat slender foundation, professed to foresee. As some 80 per cent of the freight traffic which passes by road is carried by shippers in their own vehicles, it is obvious that it would not be possible for the railways to obtain any sort of monopoly.

Amendments to the Bills

Before the bills emerged from the committee stage three important amendments were inserted. The companies are forbidden to convey by road vehicle any passenger who on any one journey is both taken up and set down in metropolitan London, an area within a radius of roughly 17 miles from Charing Cross. They are also prevented from competing with municipal tramways or omnibuses within local municipal boundaries; an attempt during the third reading of the bills to extend this prohibition to tramways and motor coach lines owned by municipalities but operated outside city limits met with failure. A third amendment, which was in fact offered by the railway companies themselves, gives the Minister of Transport power to institute an inquiry if at any time he is of opinion that the companies are abusing the powers granted to them under the acts. Apart from these amendments and some other minor restrictions the bills were passed by Parliament without further alteration. While, however, powers were granted to the four undermentioned main line groups; i. e., Great Western, London Midland & Scottish, London & North Eastern and Southern, the bill promoted by the Metropolitan Company, a London urban and suburban railway, was thrown out.

Organized Labor Supports Railways

An interesting feature of this great fight for road powers by the British railways which is worthy of record is that they have been assisted wholeheartedly by the railway trade unions, representing 700,000 railwaymen, and that the employees themselves took an active part in the campaign in the press and elsewhere prior to the submission of the bills to Parliament.

The railways of Great Britain have to their credit during the last hundred years the fostering of industry and the encouragement of travel. In the changed conditions of the years since the war their one-time monopoly of transport has practically disappeared and there is weight in the plea for a proportionate change in the conception of the relations between them and the state, of which Parliamentary approval of the bills conferring road powers on the trunk companies is the first outward manifestation. As the biggest established interest in the field of transportation, railways must join in the new forward movement which gasoline has brought about or lose their leadership of the industry. It cannot be expected that obtaining the new powers will alone be a panacea for the troubles from which they have been suffering in recent years, but it will help towards remedying them. The prosperity of an industrial country and of its railways are closely allied and unless the railways are functioning efficiently and on an economic basis the entire trade outlook will be adversely affected. The real case in support of the bills was that trade and industry were likely to suffer if the restrictions were allowed to remain.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading during the week ended September 8, which included Labor Day, amounted to 991,042 cars, a decrease of 125,906 cars from the preceding week and an increase of 1,243 cars as compared with the total in the corresponding week of last year. Loading of grain, live stock, coke, ore and miscellaneous freight was larger than a year ago but the totals for coal, forest products and less-than-carload merchandise were smaller. Loading in the Eastern and in the three Western districts showed an increase as compared with last year. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading
Week Ended Saturday, September 8, 1928.

Districts	1928	1927	1926
Eastern	213,468	209,261	222,974
Allegheny	194,054	199,439	208,532
Pocahontas	54,933	61,764	58,451
Southern	131,256	148,317	148,707
Northwestern	168,068	159,043	162,143
Central Western	148,133	135,657	147,503
Southwestern	81,130	76,818	76,678
Total West. Dists.	397,331	371,518	386,334
Total All Roads	991,042	989,799	1,024,998
Commodities			
Grain and Grain Products	57,872	57,653	41,598
Live Stock	28,919	28,900	34,653
Coal	156,393	163,885	181,800
Coke	9,842	9,706	11,808
Forest Products	58,389	62,539	67,455
Ore	60,573	54,140	73,911
Mdse. L. C. L.	230,816	234,720	235,846
Miscellaneous	388,238	378,256	377,927
September 8	991,042	989,799	1,024,998
September 1	1,116,948	1,117,360	1,143,448
August 25	1,080,840	1,109,341	1,128,563
August 18	1,056,905	1,066,828	1,081,503
August 11	1,044,442	1,049,639	1,102,660
Cumulative totals, 36 wks.	34,738,835	35,791,806	36,037,914

The freight car surplus during the period ended August 31, averaged 201,864 cars, as compared with 226,882 cars on August 23. The total included 114,355 box cars, 47,615 coal cars, 18,018 stock cars and 13,699 refrigerator cars.

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended September 8, totaled 73,819 cars, a decrease of 4,784 cars, due to the Labor Day holiday, but an increase of 15,374 cars over the same week last year.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada		
Sept. 8, 1928	73,819	36,876
Sept. 1, 1928	73,643	41,220
Aug. 25, 1928	70,875	39,343
Sept. 10, 1927	58,445	32,630
Total for Canada		
Sept. 8, 1928	2,354,647	1,403,247
Sept. 10, 1927	2,191,672	1,358,122
Sept. 11, 1926	2,087,175	1,338,046

* * *

On the West Shore

Where Are the Railways Heading?*

Diversion of traffic to other agencies, declining rates and advancing wages responsible for decline in earnings

By Samuel O. Dunn
Editor, Railway Age

AGGRESSIVE action by the railways is needed to arrest the downward tendency of the net return earned by them upon the investment in their properties. The decline in the percentage of return earned by the railways in 1927, and the further decline that has occurred thus far this year is due mainly to the diversion of passenger and freight traffic from them to other means of transportation that are aided by the government, to declining rates and to advancing wages.

The facts clearly show that the adverse influences affecting railway results have been gaining in strength within recent years as compared with the favorable influences. The percentage of return earned upon their investment averaged only 3¼ per cent during the depression of 1921 and 1922. It increased until it reached 5 per cent in 1926, but it declined in 1927 to 4.29 per cent and has been less thus far this year than last year. We hear much said of the benefits that have been derived from co-operation between the shippers and the railways, and from other means that have been adopted within recent years, to improve service and effect economies. It is time we should begin to ask who actually has been and is being benefited.

Shippers have received the benefits of more adequate and better service and reduced rates. Railway employees have benefited by advances in wages. Meantime, there has been no increase in the net operating income earned by the railways anywhere nearly commensurate with the increase in the investment in their properties. The investment in the railways at present is about $4,000,000,000 greater than it was in 1923, when railway executives adopted their comprehensive program for the improvement of railway properties, of operating methods and of service. The railways did not earn anywhere near a fair return in 1923, and yet the increase in net operating income this year over that of 1923 has thus far been at a rate sufficient to yield a return of not more than 1½ per cent upon the new investment that has been made since 1923, and the percentage of return being earned upon the entire investment is less than it was five years ago.

In most parts of the country no attempt has been made to compel motor coaches and trucks operated upon the highways to pay for their use in direct proportion to what their operation costs the public that built the highways. To whatever extent they fail to pay in proportion to what their operation costs the public, their competition with the railways is subsidized by the public. Furthermore, common carriers by highway are not subjected to such government regulation of their service and rates as the railways are.

The situation as respects water competition is similar, and a strong agitation is in progress to make it worse. Construction of the Panama Canal has made it possible for steamships to compete much more effectively with the railways than in the past. The effectiveness of their competition is enhanced by the fact that their rates are not regulated, while the railways are so regulated as to prevent them from making rates to meet water competition. Heretofore, excepting on the Great Lakes, the competition of carriers by most inland waterways has been comparatively ineffective. It is now proposed to embark upon a very extensive development of inland waterways, and the government of the United States has engaged in the ownership and operation of a barge service on the Mississippi river system, the appropriation for this service having been trebled at the last session of Congress.

It is being claimed that the losses incurred by the government in operating this barge service may be practically disregarded because of the benefits resulting to agriculture and business from having the government carry freight at rates lower than the railways can make. Undoubtedly, if we more extensively develop inland waterways, and private enterprise fails to provide boats and barges on them, it will be contended that government ownership and operation of boats and barges should be extended to all these waterways. If the cost of providing the waterways, and even the deficits incurred by the government in providing and operating boats and barges, are to be practically disregarded, then, of course, lower rates can be made by water than by rail and more business can be taken from the railways.

In addition to being our only means of transportation which has to rely upon its own earnings for the wherewithal with which to pay all the capital costs and operating expenses incurred in rendering service, the railroads are being subjected to a kind and amount of regulation which are applied to no other means of transportation. Never in any of the eight years since the Transportation Act has been in effect have they earned the fair return it assured them. The percentage of return earned by them has been declining since 1926, and yet no regulation of the rates of competing means of transportation has been adopted. Reductions of railway rates have been made, and others, especially on farm products, are threatened under the Hoch-Smith resolution; while every arbitration board organized under the Watson-Parker Railway Labor Act has awarded an advance in wages. The improvement in railway service during the last five years has contributed greatly to the welfare of the country. The reward the railways as a whole are receiving for this is not an increase, but a reduction, of the return upon each dollar of investment represented by them.

Regardless of how much it may aid other means of transportation, the public will continue for years to come to be dependant mainly upon the railroads for transportation service. If the tendencies now prevalent continue to prevail it will be only a matter of time until the public will find it can no longer depend upon the railways for the kind of service they have rendered during the last five years.

The railways should vigorously oppose the policies of the state and national governments which result in the subsidizing of competition with them and even in

* Abstract of an address before the Western Railway Club at Chicago on September 17.

the government itself engaging in this competition. They should demand either that other means of transportation shall be subjected to the same kind of regulation that the railways are, or that the regulation to which they are subjected shall be so changed as to give them entire freedom to compete with their competitors. They should seek the repeal of the Hoch-Smith resolution, which is economically unsound and will hang as a threat over the entire freight rate structure as long as it is in existence. They should seek advances in rates sufficient to compensate not only for any reductions, but to increase their earnings until they will get the fair return to which they are entitled. They should also consider whether the federal legislation under which advances in wages are constantly being awarded is working fairly.

The railways cannot continue indefinitely with an inadequate and declining net return to render good service. Their right to earn a fair return is as unquestionable as the right of shippers to good service and reasonable rates and the right of employees to reasonable wages; and there is something seriously wrong with a policy which results in the diversion of traffic from the railways by government-aided means of transportation, in reductions of railway rates and in advances in railway wages in a period when the railways are falling far short of earning a fair return.

Accident Investigations First Quarter, 1928

THE train accidents investigated by the Bureau of Safety, Interstate Commerce Commission, in the first three months of 1928, numbered 22; 12 collisions and 10 derailments, as shown in the table below. Abstracts of the reports which are indicated by an asterisk in the table, have already been published in the *Railway Age;* those for January in the issue of July 7, page 32 and those for March in the issue of August 25, page 364. Abstracts of the others are given herewith. The report numbered 1396 is published in bulletin No. 36 which was issued at the same time with the present bulletin (No. 35) having been delayed because of an extended investigation of the broken truck which was the cause of the accident.

Train Accidents Investigated in January, February and March, 1928

1390*	Chicago, S. S. & South Bend.	Parsons, Ill.	Jan.	1	C
1391*	Louisville & Nashville	Shirley, Ill.	Jan.	2	C
1392*	Great Northern	St. Paul, Minn.	Jan.	9	C
1393*	International-Great Northern	Taylor, Tex.	Jan.	15	D
1394*	Missouri Pacific	Rochelle, La.	Jan.	26	D
1395*	Missouri Pacific	Lake View, Ark.	Jan.	27	D
1396	Boston & Maine	Balloch, N. H.	Feb.	13	D
1397	Atchison, Top., & Santa Fe.	Acme, N. Mex.	Feb.	14	D
1398	Chicago & Alton	Independence, Mo.	Feb.	15	D
1399	Southern	Flippen, Ga.	Feb.	15	C
1400	Cleveland S. W. Ry. & Light Co.	Brooke, Ohio	Feb.	19	C
1401	Missouri-Kansas-Texas	Parsons, Kans.	Feb.	24	D
1402	Erie	Black Rock, N. Y.	Feb.	25	C
1403*	Colorado & Southern	Peabody's, Colo.	Mar.	6	D
1405*	Detroit, Jackson & Chicago	Austin, Mich.	Mar.	11	C
1406*	New York, Chicago & St. Louis.	Tipton, Ind.	Mar.	12	C
1408*	Florida East Coast	Titusville, Fla.	Mar.	16	D
1409*	Pennsylvania	Marsh Run, Pa.	Mar.	16	C
1410*	Chicago, Burlington & Quincy	St. Paul, Minn.	Mar.	23	C
1411*	Union Pacific	Loring, Kans.	Mar.	28	C
1412*	St. Louis-San Francisco	Nash, Mo.	Mar.	29	D
1413*	Pennsylvania	Dugrun, Ohio	Mar.	30	C

Boston & Maine, Balloch, N. H., February 13, 12:50 p.m.—A northbound freight train moving at about 35 miles an hour was derailed by the breaking of the lower arch bar on the rear truck of a coal car, the twelfth car in the train, and 20 cars following this one were piled up in a bad wreck. Five cars fell against the station building which collapsed and took fire; and the building and the five cars were burnt up; three employees and one trespasser were burned to death while eating their luncheon in the station. One employee was injured. The broken arch bar was studied by the engineer-physicist of the Bureau and a 12-page report made by him has been issued by the Commission with illustrations of the broken arch bar and of other specimens of wrought iron, old and new, which have been tested. The conclusion of the report is that an inferior grade of wrought iron had been used in the fabrication of the arch bar and that a better grade of metal doubtless would have postponed the derailment or perhaps averted it. In this and in another arch bar incipient fractures of long standing were discovered.

Atchison, Topeka & Santa Fe, Acme, N. M., February 14, 5:20 p. m.—Eastbound passenger train No. 92, moving at about 35 miles an hour, ran over a misplaced switch and struck some freight cars on a spur track, overturning the locomotive and doing much other damage. The engineman and fireman were killed and one mail clerk, one express messenger and one employee were injured. Responsibility is placed on a section foreman who had been working at that point all day and had used the switch at different times. As the weather was clear and the switch target was visible 2150 ft. away, there is no explanation of why the engineman did not stop.

Chicago & Alton, Independence, Mo., February 15, 7:17 p. m.—Westbound passenger train No. 21, moving at about 45 miles an hour, was derailed by malicious obstructions on the track, and the locomotive was overturned. The fireman was killed and seven passengers and two employees were injured. It was found that an 18-year old boy who had been in an institution for the feeble-minded and who had placed obstructions on railroad tracks on one other occasion, had placed pieces of brick, stone and other substances on the rail in the present instance. The only immediate motive discoverable was that he had been put off a freight train when he desired to get a ride to Chicago.

Southern, Flippen, Ga., February 15, 11:30 p. m.—Southbound freight train No. 55 consisting of 69 cars and a caboose, hauled by engine 5211, after having broken in two, was stalled on an ascending grade; and it was helped by a following passenger train; but after proceeding for about a mile, the couplings (between the fifth and sixth cars) again parted, resulting in the application of the air brakes. This stopped the freight train so suddenly that the passenger locomotive crushed the caboose, and did much other damage; and the conductor of the freight was killed. Two other employees were injured. The passenger engine had pushed the freight without being coupled to it and without having the air brakes connected; and although the cause is given in the report as the break-in-two, the inspector says that if the air brakes had been coupled through both trains, the serious damage and loss of life would have been prevented.

The trainmen thought that the couplers had slipped by each other (because of the parts being worn) but the government inspector finds that the coupler of the sixth car was lower than that of the fifth, and that one rode over the other, thus uncoupling the cars. The car with the low coupler had been received from the Louisville & Nashville on the morning of the 15th, where the inspector should have rejected it because of the sagged condition of the arch bars and truck frames, which defect in the truck was the cause of the coupler being too low. The inspector who inspected the cars in the train, when it started out, also made "a more or less casual inspection" without noting this defect; and he had omitted to make mention of four other cars in

the train on which the government inspectors found defects. Two inspectors at Inman also failed to make note of these defective cars although there were other cars in the train which were discovered by them and taken out. The report calls upon the railroad to take steps immediately to improve inspection.

Cleveland Southwestern Railway and Light Company, Brooke, Ohio, February 19, 5:25 p. m.—Westbound passenger train No. 613 consisting of a single electric motor, moving at about 15 miles an hour, collided with eastbound freight extra No. 413 consisting of a single-electric motor, badly damaging both cars. The motorman of No. 613 and one passenger were killed and three passengers and two employees were injured. The conductor and the motorman of the extra both overlooked No. 613 though they claimed to have examined the timetable only a few minutes before the collision. Both men averred that they had had proper rest before going on duty and said that they had nothing on their minds to distract their attention from their duties. The inspector finds that the wooden car penetrated the steel one, the floor of the steel car being lower than that of the other. Suspensions for dangerous practices were found in the records of both the conductor and the motorman.

Missouri-Kansas-Texas, Parsons, Kan., February 24, 9:15 p. m.—Northbound passenger train No. 6, moving at good speed, was derailed at a point where the track had been maliciously weakened, and the locomotive and first car were overturned; much other damage was done. The fireman was killed and one other employee was injured. A feeble-minded young man of 18 years, had loosened a joint in the track. The same person had previously confessed to wrecking a train on the Chicago & Alton, at Independence, Mo., and he had committed other similar crimes. He has been sentenced, at Erie, Kan., to imprisonment for from ten years to life.

Erie, Black Rock, N. Y., February 25.—A westbound freight train moving at about 35 miles an hour, collided with a string of freight cars standing on the main track, making a bad wreck. The engineman was killed and one other employee was injured. This collision occurred on a line where no scheduled trains are run and where all movements are under yard-limit rules. The engineman having been killed, the inspector could give little explanation of his negligence. The conductor and brakemen appear to have been aware that the speed of the train was higher than allowable but took no active interest in calling the attention of the engineman to the danger. The practice of leaving freight cars standing on the main track for long periods of time is common at this place and this practice is criticised. Under some circumstances, a red lantern is placed on the end of such a string of cars, but that safeguard was neglected in this case.

Car Department Supervisors' Associations Unite

Joint convention at St. Louis ratifies executive committee action—Well-balanced program presented

WITH a total combined registration of 695, including 368 railroad members and guests, the Railway Car Department Officers' Association held a joint convention at the Hotel Statler, St. Louis, Mo., September 11 to 13, inclusive, featured by numerous instructive addresses and committee reports presented in a well-balanced program. By far the most important and constructive work of the joint convention, however, was its keen debate and final ratification of previous executive committee action looking toward the merger of the two associations. The plan for merging or consolidating the associations was approved.

The name selected for the new association was the "Master Car Builders' and Supervisors' Association," the membership being designed to comprise railway master car builders and all car department men employed in a supervisory capacity; the object, to promote more efficient maintenance and use of cars, by the discussion of interchange rules and all branches of car department work not now given detailed consideration by the Mechanical Division of the American Railway Association.

Election of Officers

The following were elected officers of the new association: President, S. O. Taylor, master car builder, M. P., St. Louis, Mo.; first vice-president, C. J. Wymer, superintendent of the car department, C. & E. I., Danville, Ill.; second vice-president, K. F. Nystrom, superintendent of the car department, C. M. St. P. & P., Milwaukee, Wis.; third vice-president, F. A. Starr, supervisor of reclamation, C. & O., Richmond, Va.; fourth vice-president, L. R. Christy, master car builder, Gulf Coast Lines, I.-G. N., Houston, Tex.; secretary-treasurer, A. S. Sternberg, master car builder, Belt Ry. of Chicago, Chicago.

The board of directors consists of Chairman G. W. Moore, assistant superintendent motive power, Frisco, Springfield, Mo.; (two-year term) P. Kass, superintendent of car department, C. R. R. I. & P., Chicago; C. J. Nelson, chief interchange inspector, Chicago Car Interchange Bureau, Chicago; O. H. Clark, supervisor of car repair bills, I.-G. N., Houston, Tex.; W. J. McClellan, special inspector, N. Y. C., New York; C. A. McBurney, master car builder, Transcontinental Oil Co., Tulsa, Okla.; (one-year term) A. Armstrong, chief interchange inspector, Atlanta, Ga.; C. M. Hitch, district master car builder, B. & O., Cincinnati, Ohio., and E. J. Robertson, superintendent car department, Soo Line, Minneapolis, Minn.

Features of the Program

The convention was divided into six business sessions, three morning sessions being presided over by G. W. Moore, president of the Southwest Master Car Builders' & Supervisors' Association, and the afternoon sessions presided over by E. R. Campbell, president of the Railway Car Department Officers' Association. In his opening address on the morning of September 11, President Moore outlined the objects and advantages of consolidating the two associations and mentioned the following car department problems, toward the solution of which a great deal has been accomplished

during the past few years, but which still need the attention and study of car department officers: Proper care of journals to avoid hot boxes; maintenance of brakes; proper inspection of cars at loading and terminal points to avoid subsequent troubles, such as damage to commodities, transferring loads or accidents due to defective equipment.

Speaking for L. W. Baldwin, president of the Missouri Pacific, E. H. McReynolds, assistant to the president, formally welcomed the convention to St. Louis. Mr. McReynolds said that there is too great a tendency for railroad men to confine their efforts and attention solely to their respective departments, losing sight of the fact that only through close co-operation can the best operating results be secured. He made a special plea for car department officers to help the publicity departments on their respective roads by furnishing information regarding unusually good operation, needed in properly informing the public regarding the progress and accomplishments of the railroads. He said that the time is here when railroad officers must inspire all employees to "sell" the railroads to the public in order to meet the present crisis caused by motor, air and water competition.

Henry Miller, president of the Terminal Railroad Association of St. Louis, then addressed the convention. He was followed by R. C. White, assistant general manager of the Missouri Pacific, and R. H. Innes, inspector, Bureau of Explosives, Dallas, Tex. Other individual papers presented at the convention included "Higher Maintenance of Freight Car Equipment to Reduce Terminal and Transit Delays," by L. R. Wink, assistant superintendent car department, C. & N. W., Chicago; "Freight Claim Prevention in Relation to Maintenance of Freight Car Equipment," by J. Marshall, special representative, A. R. A., Chicago; "The Elimination of Angle Cocks from Passenger Car Equipment," by J. P. Stewart, general supervisor of air brakes, M. P., St. Louis; "Efficiency of Car Shop Operation," by B. J. Huff, efficiency supervisor, C. & E. I., Danville, Ill.; "Testing of Car Materials," by J. R. Jackson, engineer of tests, M. P., St. Louis, and "The Inspector," by A. Armstrong, chief interchange inspector, All Lines, Atlanta, Ga. The report of the Question Box Committee, J. Matthes, Jr., traveling car inspector, Wabash, Decatur, Ill., chairman, was read and discussed, also the joint report of the A. R. A. Committee, H. A. Sigwart, supervisor car repair bills, M. P., chairman.

Greater Car Mileage Is Paramount Need

By Henry Miller

President, Terminal Railroad Association of St. Louis, St. Louis, Mo.

Since freight cars are now practically used universally, it is of the utmost importance that every effort be made to expedite the movement of traffic by simplifying the rules in every possible way. Certainly, no rules which tend to slow up repairs or interchange should be considered, and nothing should be left undone to facilitate car movements safely.

When you take into account that the average mileage of freight cars is about thirty miles per day, and that this is the common speed per hour of a freight train, you will realize that the problem of making greater mileage is the paramount consideration.

None of you would consider employing labor or machinery that only rendered one hour's service in the twenty-four, and it is my suggestion that you take this fact home and do your part to improve car mileage.

The division of car service of the American Railway Association has an effective organization, which has greatly improved the distribution and use of freight cars, a distinct advance in car efficiency; however, many local associations have made rules dealing with purely local conditions, and these are essential but too often obstructive.

Cars are often set back by too technical inspection; in fact, instances have come to light where the inspectors of connecting lines, contending with each other, go out of their way to find reasons for rejecting rather than for passing cars in reprisal for similar activities, unnecessarily delaying both the cars and their lading. Such delays are costly to both the railroad and patron; hence, your slogan should be to keep cars moving in their authorized direction, avoiding setbacks.

To this end, one of the best rules in the category, to my mind, is the requirement that a receiving line shall run, repair or transfer all loaded cars, thus eliminating the lost motion of setbacks, the bane of every large terminal.

Railroads get their "bread and butter" from freight revenue. Their investment in freight cars is enormous, and has been increased within the past six years by the addition of 800,000 cars costing $1,500,000,000; therefore, I repeat that your membership should exert their influence in every way that will tend to increase car efficiency.

The American Railway Association has had under consideration for many years and some progress has been made in the standardization of freight cars. There is no more important problem for your membership to study and give constant attention to than the standardization of freight cars, particularly those parts that require frequent repairs and renewals.

Examination in a large car repair plant revealed the fact that on cars of the same capacity, parts such as trucks, bolsters, center plates, arch bars, draft gear, bolts and many other parts that wear and become defective, were of different size and standard in amazing numbers; therefore, apart from your own material requirements, it becomes necessary to carry a large stock of different parts for the many different "foreign" sizes and standards. The investment in them is considerable, and cars are frequently held until the material is shipped long distances. All of these things work against efficiency of car movements and mileage, and tend to increase the cost of maintaining the equipment.

This phase of the car business assumes enormous proportions in large terminals such as we have in St. Louis, where the turnover annually is about 2,500,000 freight cars, the equivalent of every freight car in the United States. Here, the daily complications arising from the use of many different standards by the railways are a constant and continuous problem greatly emphasizing the necessity for simplifying the rules and standardizing the equipment in order to get the best results in the use of freight cars.

We recently built a number of locomotive tenders, the under-frame of each being a steel casting with the bottom or floor cast integral, and the side and end sheets of the cistern welded to it. All joints, braces and attachments were welded—no bolts or rivets—thus creating one-piece construction above the trucks. The weight was about 60,000 lb. and the capacity 110,000 lb. Also a one-piece frame for locomotives, was developed reducing and simplifying the number of parts immeasureably and providing increased durability and decreased maintenance. Perhaps this type of construction might be applied to freight cars and prove more

substantial and simple than the present method. Another essential feature of the car business is caused by the almost universal use of freight cars. They are sent all over the United States and Canada, with the result that cars are frequently away from home a year or more. The practice of simply giving them a "lick and a promise," to permit disposition of the cars from one road to another, results in under maintenance. It is of the utmost importance that freight cars be well maintained in order that they may produce maximum mileage and revenue.

I have always thought that it might be well to consider having a common repair shop at large concentration points; by that I mean that large railroad centers like New York, Chicago, St. Louis, Pittsburgh, Buffalo, Cincinnati, Kansas City and other similar centers that produce and receive large amounts of traffic, where large numbers of cars naturally accumulate, should have repair plants of common or community ownership sufficiently large to make all repairs, and if necessary, provide for a general overhauling of freight cars. Railroads may have ample capacity at their own shops to do their own work, but the problem of getting the cars to these shops is one of great moment.

Moreover, at these large railroad centers, cars are more frequently damaged, and few railroads have large car repair plants at these large centers. This frequently necessitates hauling damaged cars, the repair of which requires their going to a general shop, long distances, involving a loss of time that in many instances runs into months before the cars finally reach repair shops and are repaired and resume service; hence, it seems to me that it would pay the railroads of the country to consider the establishment of large repair plants of common ownership at places where cars could be repaired most conveniently and economically, or adopt some equally effective plan to reduce bad order cars to the minimum and improve the standard of maintenance, the necessity for which you all recognize.

The latest bad order report, 6.7 per cent, tells its own story. If kept below 4 per cent there would be available for use about 70,000 more cars, the earnings of which would go a long way toward paying the interest on the suggested plan.

Some Railroad Problems

By A. E. White

Assistant General Manager, Missouri Pacific, St. Louis, Mo.

The number of bad order freight cars on line has been reduced from 7 per cent in 1920 to 5.9 per cent last year and we all know or should know that the average number of miles per car per day has increased 21 per cent in the same period, or from 25.1 miles per day in 1920 to 30.3 in 1927. We all should know, also, that the average work performed by a freight car has increased from the equivalent of carrying 498 tons a mile for each car to 518 ton-miles while the number of cars per train has increased from an average of 37 to an average of 47. The average tons per train have increased from 708 in 1920 to 778 in 1927, or 10 per cent, and train speed has increased from 10.3 m.p.h. to 12.3 in the seven year period, an increase of 19 per cent.

All of these things, and many others that might be mentioned, have intensified the problems of the master car builder. And while all of you are familiar with these items and many of you are deeply interested in other, seemingly unrelated questions, it is those other questions I intend to discuss with you.

The time has come when every employee of a railroad, whether he be an unskilled laborer or a general officer, must give serious attention to the problems of the other fellow. This is a presidential election year and while I hope the time never will come when railroad men, as such, will try to influence the political destinies of our country, or feel that it is necessary to try to do that, we cannot ignore the situation for it has a very direct influence on the railroads and on each of us.

There has been a popular superstition in the United States for years, to the effect that a presidential election year is a year of poor business conditions. The facts are all at variance with this belief. In truth, with the exception of one or two such years, notably 1908 which followed the panic of 1907, each presidential election year has been a record breaker in all of those things which make up the measure of our prosperity. And this year, which got away to a bad start, bids fair to wind up next winter with a record of business volume —the best barometer of prosperity—that will tax the railroads to very near their capacity.

That the railroads will be able to handle any business offered, there isn't the slightest doubt. As a result of the remarkable achievements of the last few years, our railroads are in a position to produce adequate, dependable and satisfactory service for any volume of traffic that can be offered. We have that idea pretty well "sold" to the public today but there still are many people who help to create business depression by expecting hard times, and talking about them whether or not the facts justify such expectation and conversation.

Competition Provides Greater Railway Problems

The greatest problems of the railroads today are not included in the dangers of hard times or business depression. On the contrary, some of the things that are the greatest factors in our national prosperity constitute the gravest of dangers to the continued prosperity of the railroads. One of these, and one which every railroad man should know about and study constantly, is the growth and development of the automotive industry.

It is true that the railroads receive thousands of car loads of automobiles, parts, accessories and fuel for automobiles each year, and this traffic and the revenue from it offsets, in a measure, some of the traffic losses those automobiles take from the railroads the moment they are placed on the highways. But the fact remains that the automobile is and has been for years, taking away from the railroads each year a constantly increasing volume of business.

How many of you realize that the total registration of automobiles in the United States in 1911 was 619,500? And how many realize what is involved in the figures which show that this number had increased in 1920 to a total of 8,225,859 while in 1927 the number of passenger automobiles registered had reached the staggering total of 20,230,429 or 171 passenger automobiles for each 1,000 inhabitants.

We are not going to find the answer to this problem here in this meeting. Some of the best railroad minds in the world have been struggling with it for several years and a satisfactory solution has not yet been found. But it is true that, generally speaking; the railroad men did not recognize the danger until it was almost too late, and it also is true that everyone of you should be giving a question of this kind the most serious consideration. There are countless things each of you can do to be helpful. And by intelligently studying the problem and analyzing it for the benefit of the men under you, all of you can do much to help in bringing about the final answer.

The same thing applies to the airplane. At the present rate of development, the airplane will, within a few

years, occupy the same position with respect to transportation, especially railroad transportation, that the automobile did 15 years ago—and now is the time to begin to think about that problem. I am not advising you to go out and learn to fly—although I believe it won't be many years until most of us are doing that. Every person in this room can remember only a few years ago, when people remarked that they never expected to step into an automobile which was regarded at that time as a rich man's plaything.

We are going through that same period now in the air, and while we are trying to convince ourselves that the airplane never can be a serious competitor of the railroads, passenger and freight routes to connect our population centers are being established and the production of airplanes is increasing at the rate of more than 50 per cent a year over the previous year. A little mathematics will soon show you where this will lead in five years.

It is true that there must be a saturation point somewhere. It was generally believed five years ago that the automotive industry had almost reached it—but each year since then all production records have been broken and the so-called point of saturation apparently is as far away as ever.

In the words of an old farmer philosopher, we are confronted with a condition, and not a theory. The automobile has come to stay. It is an economic necessity in our present-day scheme of things. America could not do without it. And the airplane is coming to stay. It won't be many years until we look back and wonder how we ever got along without them just as we do now look back on "the good old days" before the automobile.

So we may as well face the facts, study them, and try to figure out how they are going to affect us, and prepare ourselves to meet changing conditions.

We are living in the greatest age of change in the history of the world. It isn't necessary to enumerate items like the development of radio, television, and things like that. Right in the railroad business, if we were operating today as we did just 10 years ago or even five years ago, most of the railroads in the country would be on the verge of disintegration.

Confronted as the railroads are with the necessity for meeting more and keener competition, with constantly increasing wage and material cost and constantly decreasing rate levels, it is up to every department on every railroad to meet this situation with increased efficiency. And I am proud to say that to my knowledge there is no department of railroading that has done more to meet the situation than the car department. With innovations such as progressive building in the car shops and efficiency scheduling on the rip tracks, not to mention numerous other improvements in methods and practice, you have been doing your share.

But we can not stop now. Railroading is coming more and more to be a progressive science. Newer and better methods of operation must be developed, and more and more efficiency must be developed in the maintenance departments. The railroads can start slipping very quickly if any of us relax for even a brief time our efforts to keep them going forward.

I do not want to leave the impression that automobiles and airplanes are all that we need to worry about. In a way, just as serious a problem is involved in inland waterways transportation. And the economic position of each group of American producers and consumers has a very direct bearing on all of us.

Before I leave this question of competition on the highways, the waterways and the air, I should like to outline, as I see it, the position of the railroads with regard to these forms of competition. No railroad official that I know is opposed to the automobile as such. Every official that has given the matter any thought is of the opinion that the automobile has come to stay, and that waterways and airways competition will become greater in days to come. No one would like to see any of these forms of transportation, all of which are marks of progress, abolished.

But, when an automobile or an airplane or a barge or boat is operated for profit in the business of transporting passengers or freight, I feel that the operators of such methods of transportation should be required to submit to a measure of supervision and regulation similar to that under which the railroads operate.

Automobiles operated for hire certainly should be required to pay their fair portion of the construction and maintenance cost of the highways they use most, and to which they do the most damage. And if they are going to enter the field of transporting passengers and freight they should be required to publish and live up to, as do the railroads, regular schedules and tariffs. This applies also to river transportation, and there are some of us who feel that it is unfair for the Government to furnish free right of way at staggering cost, and subsidize river transportation in numerous other ways and then permit these subsidized carriers to automatically charge less for their service than the rail rates—and make up the differences or the deficits of the river carriers out of public funds—tax monies to which the railroads are perhaps the largest contributors.

We hear a great deal of the terrible plight of the farmer and the need for relief for the agricultural industry. A group of farm paper editors meeting recently at Detroit, discussed this question from every angle and finally decided that while farmers in the United States are dissatisfied, they actually are better off than the farmers in any country in the world and better off than the farmers of the United States ever have been, in the history of our country.

It finally was the consensus of opinion that the dissatisfaction and unrest of the American farmer is a healthy condition, for, it was pointed out, "since the dim dawn of history, when Babylon was a cross roads town and Abraham was a babe prattling in his cradle, the farmers of the world have been dissatisfied and apprehensive of the future."

To my mind, the unrest and dissatisfaction of the American farmer is all right and natural; it is responsible for much of the advance in our American standard of living, on the farm as well as in the industrial center. So let us hope that the American farmer never permits himself to be satisfied with conditions as they are but always keeps striving for more and better things.

We should realize, however, that what he needs most is the application of ordinary business methods such as those that you and we have been applying in the railroad business. What the farmer needs is more economical production and better, not necessarily cheaper, distribution. So far as the law of supply and demand is concerned, there would seem to be little for the farmer to fear if he can bring about an orderly distribution of his products.

The point I want to make is this. We are largely dependent, in the Southwest, on the prosperity of the farmer. It is, therefore, up to us, as railroad men to help work out this problem. And I am satisfied that, with aggressive cooperation on the part of all of us, the answer will be all that we could want it to be.

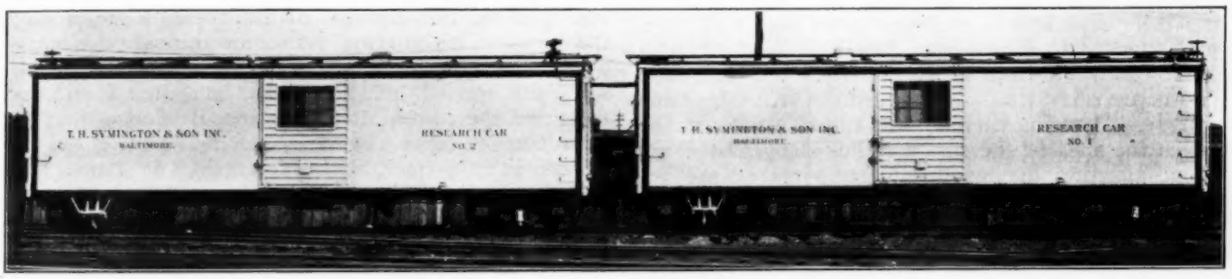
To Study Truck Action

Plant at Baltimore includes especially equipped track and freight cars fitted with recording instruments

LITTLE, if any, exact information is available concerning the action of various types of freight-car truck construction in entering and leaving curves and in resisting the tendency to derail on warped track. In order that exact data concerning the functioning of trucks in these respects may be obtained, a research plant has beeen built by T. H. Symington & Son, Inc., Baltimore, Md., at the South Baltimore car works of the Standard Steel Car Company, Curtis Bay, Baltimore.

Facilities of Plant

The plant consists of tracks in which special facilities have been incorporated for measuring the wheel flange pressure necessary to turn a truck under varying conditions of track surface, and in which are also a level tangent and two curves on which the relative elevation of the outer and inner rails may be varied to represent the various conditions, some encountered in regular service and others beyond the possibility of normal safe operation. Operating on these tracks are two research cars, each equipped with instruments to measure truck spring reactions, lateral shocks, car body roll, and car speed. Each instrument on both cars operates a recording pen on the recording table set up in one of the cars, the paper on which travels at a rate proportional to car speed.



Two Cars Equipped with Instruments for Measuring and Recording Truck Spring Closure, Lateral Body Shocks and Body Roll

The Track Facilities

To determine accurately the wheel flange pressure required to turn any car truck under varying conditions of track warp, a special turn-table has been placed in one of the tracks, the center of which is 30 ft. from the center of a 10-ft. section of one rail which can be elevated 3 in. above the level track surface. With one truck of the car centered on the turntable rails and the other over the 10-ft. elevated rail section, any track warp up to that equivalent to a run-off of 1 in. in 10 ft. can be reproduced, and the effect of such run-offs on the flange pressure necessary to turn the truck, such as would be necessary on entering or leaving a curve, can be accurately measured.

Turntable Is Specially Designed

The turntable has been carefully designed and built to produce a constant turning resistance under loads at the track rails of varying degrees of eccentricity up to the maximum with the standard side bearing spread of 50 in., which is 83 per cent on the heavily loaded rail and 17 per cent on the lightly loaded rail. It is built of two 80-in. locomotive tires, one of which serves as the stationary track and the other as the revolving support. These tires, placed face to face, are separated by steel balls housed in carefully machined grooves in the opposing tire faces. The lower ring is bedded in a concrete foundation and the track rails are supported on a structural steel framework which is bolted to the top ring.

Force Applied at Point of Rail and Wheel Flange Reaction

Attached to the turntable is a pull-rod and lever, the fulcrum of the latter firmly anchored about 6 ft. from the side of the track. To one end of the lever is attached the pulling line leading to a block-and-fall anchored at some distance from the track. Between the line and the lever is inserted a dynamometer, from which can be read the pull at the instant the turntable begins to move. The force is applied to the turntable at right angles to the center line of the track and at a point 4 in. outside of the wheel contact—in other words, at the point of rail and wheel flange reaction.

The 10-ft. section of lifting rail is carried on an I-beam in a concrete pit and is supported on two jacks so placed as to be approximately under the lines of contact between the rail and the truck wheels. This rail can be elevated 3 in. above the level surface of the adjoining track.

Force Required to Start Cars Under Various Truck Conditions Measured

Adjoining the level tangent track is a curve of 120 ft. radius, the super-elevation of the outside rail of which may be controlled to produce a run-off varying from zero to 9 in. in 30 ft. On an adjoining track is a 10-deg. curve, the elevation of the outside rail of which may be dropped to a maximum of 9 in. below the elevation of the inside rail. This is intended to reproduce a characteristic condition of washout, which can be carried beyond the conditions necessary for normal safe operation. Suitable provision has been made on the level tangent track for measuring the force required to start the cars under various truck conditions.

The research cars are steel box cars of 55 tons nominal capacity, in the construction of which special attention has been given to produce a rigid structure. Each

car contains 12 rectangular water tanks extending approximately from the floor to the roof, three on each side of a centre aisle at each end. The cars have a light weight of 46,500 lb. and a minimum load of approximately 18 tons with the water tanks empty. Insulated pipe connections connect the tanks under each car to a single filling connection, with valves in the pipes permitting the car to be operated with either four, eight or twelve tanks filled. In the latter condition, the total load amounts to approximately 57½ tons and the center of gravity of the car is approximately at the same height as in the majority of 70-ton coal cars. With all tanks equalized, varying loads from 20 tons to the full load may be obtained by varying the height of water in all of the tanks, thus obtaining a variety of heights of the center of gravity. A glass gage is placed on the side of one of the tanks nearest the center of each car, by which the level of the water in the tanks, when all are equalized, may be read in terms of tons of load and height of the center of gravity.

Recording Table

The recording table is located in car No. 1, and an ingenious arrangement of tension wires, passing through sliding attachments on supporting steel tapes, transmits the movement of the various measuring instruments to the pens on this table. The tape-supported wires from car No. 2 are carried through a flexible hose connection between the adjoining ends of that car to Car No. 1. The hose is anchored in the end of car No. 2 and attached to a crosshead free to move longitudinally in car No. 1 from which the wires and their tape supports are carried forward toward the recording table in long, easy hanging curves. Variations in the distance between the ends of the cars are thus compensated for without affecting the length of the wires or the accuracy of their longitudinal movement between the instruments on the cars and the pens at the recording table.

Compression Indicators on Forward Truck

The forward truck of each car is provided with two truck-spring compression indicators, one on each side. Over the center of each forward truck is placed a pendulum-type shock indicator, set to record lateral shocks. Each shock indicator has two pendulums, each indicating the force in one lateral direction only. On one side of the rear truck of each car is an instrument which measures the vertical movement of the side sill of the car with respect to a point on the side frame of the truck. This device is so arranged that it automatically compensates for the lifting action of lateral motion devices if the truck is equipped with such a device, and thus records the vertical component of the motion at the side of the car due to car roll only. There are thus five recording pens for each car. An additional pen records the speed of Car No. 1 and a manual contact type pen is provided so that the operator may mark any point on the chart for notations pertaining to a corresponding point on the road. There are also six reference line pens.

Two Rates of Paper Travel Available

The paper roll is driven from the car axle and the transmission is arranged so that two rates of paper travel are available—1 in. per 100 ft. and 5 in. per 100 ft. The banks of pens for the two cars are so spaced that the records for the two cars at a given point on the track are directly superimposed, one of the pen supporting bars being movable so that it may be properly set to meet this condition for either rate of paper travel.

Each car is equipped with a heater and one of the cars is fitted with toilet and lavatory facilities. Doors through the adjoining ends of the cars permit passage from one to the other while in operation. A window-opening, covered with heavy plate glass, is cut through the floor back of the water tank behind the leading truck of each car, in line with the rail. An arrangement of mirrors permits an observer inside the car to watch the operation of the truck, looking forward parallel to the rail.

The Test Program

A program of investigations to be made at the research plant has been laid out and will begin Monday, October 1, to which representatives of the railroads have been invited. This program includes the determination of flange pressures to swivel the truck under a car carrying a load of 55 tons, with various amounts of track warp; the depth of depression on the outside rail of a 10-deg. curve to cause derailment of a car with a load of 18 tons (water tanks empty), with side bearing clearances varying from none to ⅜ in. in steps of ⅛ in.; the amount of track warp on a curve of 120 ft. radius to cause derailment with the water tanks empty and with the same range of side bearing clearances; the comparative curving resistance through the curve of 120 ft. radius with level track and dry center plates, with side bearings making contact and free from contact; and the comparative resistance of flange drag on level tangent track caused by the truck being out of square with the track, with side bearings in contact and out of contact. The two latter tests will be made with dry center plates. In general, the tests will be repeated with variations in truck conditions, including dry and greased center plates, friction and roller side bearings, and with rigid and flexible spring plank connections. The scope of the investigations may be extended, should other variations be suggested.

Following the completion of the program of investigations at the plant, the cars will be utilized for further investigations in road service.

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Photograph by Hoag & Ford, Los Angeles.

A Typical Viaduct in the Mountains of Western Mexico on the Line of the Southern Pacific of Mexico

Accidents and Protective Devices at Grade Crossings*

A discussion of the general problem, with an explanation of excellent results being accomplished in the State of Connecticut

By E. Irvine Rudd,
Chief Engineer, Public Utilities Commission, State of Connecticut

THE railroad-highway grade crossing problem is increasingly important. The loss of life, injury to persons and damage to property are becoming so great as to demand energetic action on the part of those having jurisdiction over grade crossings and motor vehicle operators. Apparently, accidents are a minor function of the number of crossings or the number of trains, being dependent almost entirely on the number of motor vehicles registered. To keep pace with the mania for motor car speed, protective devices at grade crossings have increased in number. Bells, banjo signals, lights and gates are in general use. The white flag of the crossing watchman has been replaced with a "stop" disk and an approach warning sign has become a statutory requirement in many states.

None of these forms of protection is entirely satisfactory for night use where reasonable speeds of vehicles may be as high as 30 to 40 miles per hour. Signal engineers have developed color-light and moving-light signals in an effort to provide a visible warning, a sufficient distance from the railroad track, so that a driver may bring his car to a stop clear of the approaching train. These designs have now crystallized into a standard adopted by the Signal Section, A. R. A., as follows: "An electrically or mechanically-operated signal used for the protection of highway traffic at railroad crossings shall present toward the highway, when indicating the approach of a train, the appearance of a horizontally swinging red light and/or disk."

Connecticut and New York have approved as standard the alternately flashing red light with 30-in. horizontal separation of lamps and a frequency of 30-45 flashes per minute for each light. We are now considering the advisability of making the electric flasher double-faced at crossings with two or more main tracks, hoping thereby to prevent a driver, who creeps past a signal while a train is passing on the near track, from getting struck by a train moving on another track. The 1926 Accident Bulletin of the Bureau of Statistics of the Interstate Commerce Commission shows that there were in the United States 234,280 crossings of highways with railroads at grade, practically one for each mile of railroad. About 12 per cent of these are protected manually or automatically. Along the Atlantic seaboard from Washington to Boston, where the density of population per mile of railroad is high, the eight states have 31 per cent of their 25,240 grade crossings protected by men or automatic signals. Connecticut, with 961 miles of railroad, has 1,289 highway-railroad crossings, 703 being at grade, of which 134 are state highways, 114 city streets, and 455 town roads. Of these grade crossings, 66 are protected manually 24 hours daily, 76 are protected manually less than 24 hours daily, and 113 are provided with automatic protection.

The annual cost to the railroads operating in Connecticut for furnishing this protection is $320,000. If all the grade crossings in our state were protected manually or automatically, the annual cost would be approximately $375,000, and it would require an additional capital expenditure of about $700,000. Is it fair for the patrons of the railroad to bear the entire expense of protecting the highway users of railroad grade crossings? It would be more equitable if the cost of grade crossing protection were borne by the several interested parties in the same proportion as grade crossing elimination expense is shared; approximately a fifty-fifty basis. If large expenditures by highway departments for improving highway safety, such as reducing grades and flattening curves are justifiable, then why should not some of these highway improvement funds be spent on installations of automatic signals at highway-railroad grade crossings?

During 1927, there were, in Connecticut, 64 collisions of autos with trains, killing 13 people and injuring 39. During the same period, 13,208 auto accidents occurred at highway intersections, with 90 killed and 5,591 injured.

Registrations have increased 84 per cent, total accidents have increased 133 per cent, accidents at intersections have increased 494 per cent, but motor vehicle accidents at railroad grade crossings have increased only 28 per cent in number and have actually decreased from 7.8 to 5.4 per thousand registrations.

The Public Utilities Commission of Connecticut began in 1914 to make records of all grade crossings. The description of each crossing gives information about the number of tracks, the volume of highway traffic, the views from the highway in the four directions, the grade of the highway, its surface material, whether town, city or state, and its classification on a scale of hazard descending from "A" to "E." Short abstracts of happenings at a crossing are kept so as to complete the record. A sketch and two to four photographs are provided to assist in visualizing the crossing. The crossings are numbered on the bridge mileage basis, the numbers being painted on the post of the crossing sign.

For the 12-year period ending December 31, 1927, 580 accidents have occurred at crossings in Connecticut; 134 of these were without personal injury; 247 persons were killed and 426 injured, of whom 109 were pedestrians. No train was involved in 35 cases. No accidents have occurred at 423 crossings, of which 58 are protected manually or automatically, divided about equally between 24 hours and less than 24 hours, and 365 are equipped with signs only. To put this in another way, all the accidents have occurred at only 41 per cent of the crossings. A study of the record

* Abstract of a paper presented before the Sixth Annual Conference of Public Utility Commission Engineers, Washington, D. C.

of accidents which had occurred in the 10-year period ending May 1, 1925, disclosed that 71.5 per cent of the accidents occurred in the daytime, 49.2 per cent occurred between May 1 and November 1, 52.4 per cent occurred at protected crossings, and 46.6 per cent occurred at crossings where the views were good.

In 1926, one person was killed every four and one-quarter hours. The elimination of crossings, education, standardization, protection, co-operation, instruction, examination, correction and conviction each plays a part in reducing this slaughter but no one alone can win the game.

Table Showing Relation Between the Number of Motor Vehicle Registration and Accidents in Connecticut for Six Years

Year	Motor Vehicle Registrations	Total M. V. Accidents	Accidents at M. V. Intersections	Accidents at R. R. Crossings
1922	161,347	11,513	2,223	126
1923	189,566	16,500	4,280	153
1924	224,771	20,781	7,241	151
1925	262,564	22,568	9,369	179
1926	274,900	24,326	11,484	158
1927	296,805	26,832	13,208	161

Each year about 1,200 crossings are eliminated in the United States. Continuing at that rate, it will take almost 200 years to get rid of the ones we have now, without taking into consideration the new ones being established every year. The establishment of any new grade crossings should be prevented, which can be done without cost to the communities or the railroads. The state legislatures have the power to enact a statute similar to the one passed by the Connecticut legislature in 1883, viz: "When a new highway shall be constructed across a railroad, such highway shall pass over or under the railroad, as the commission shall direct. The company operating such railroad shall construct such crossing to the approval of the commission, and may take land for the purposes of this section in the manner provided by law for the taking of land by railroad companies. One-half the expense of such crossing shall be borne by the company constructing the same, and one-half thereof shall be paid to said company by the town, city or borough which constructs such highway." This statute operates to prevent the indiscriminate laying out of highways across main-line railroad tracks; another statute empowers the commission to permit grade crossings of industry tracks, after hearing and finding thereon. The real estate developer must arrange his streets in parallel, instead of across, the railroad.

From the annual report of the Railroad Commissioners of Connecticut, dated January 1, 1884, there appear to have been 1,223 railway-highway grade crossings; the Public Utilities Commission records of January 1, 1928, show 703 grade crossings. This rate of reduction, 520 crossings in 44 years, if continued, will have eliminated all grade crossings by 1988, about 100 years after the enactment of the statute prohibiting the establishment of new ones.

Crossing signs and signals should present the same aspect to the highway traveler in Maine, California, Michigan or Texas. The approach warning sign is standard in 37 states; the cross-buck or windmill sign at the railroad should be made uniform; gates should have the same striping; all flagmen should be equipped with the same design "stop" disk mounted on a five-foot stick, at night swinging their red lanterns in the same horizontal arc; and only one kind of automatic signal should be used, the visible A. R. A. standard. Full value of the visible crossing signal has not been realized, for heretofore it has always been automatic; if it were manually controlled, one crossing tender in an elevated tower could handle several crossings near together, a desirable, economical, manpower-saving accomplishment.

Gates are not clearly visible in the rays of an auto headlight bright enough to show objects 200 ft. away, and the red lantern hung on the gate is often mistaken for an auto tail light; a reflecting sign showing the word, "stop," mounted on the gate, might be an improvement over the lantern. The New York, New Haven & Hartford had 508 gates smashed in the 22 months prior to November 1, 1926, although only 25 of these accidents ended in collision of auto and train.

The highway should be straight with a smooth surface over the railroad tracks and there should be no obstructions in the travelled way to distract the attention of the motor driver from his job of watching out for approaching trains and observing any signal indication.

Having provided means for a highway user to inform himself that he is approaching a railroad crossing, that the track is at a definite place, and that a train is or is not coming, the next step is to educate users of the highway to recognize these warnings, and immediately bring their vehicles under control. A chart picturing the signs, naming them, and defining their meaning in signal parlance has been posted in all the railroad stations and in many hotels and garages in Connecticut. One year, a pamphlet copy of this poster was handed each motor vehicle operator with the driver's license. The head-line treatment of every grade crossing accident serves to focus the attention of all newspaper readers on the danger of failing to exercise caution at a railroad crossing. The National Safety Council distributes posters with appropriate titles. Each year the railroads inaugurate a campaign of "Cross Crossings Cautiously."

Applicants for licenses to operate motor vehicles should be required to demonstrate their knowledge of highway-railroad grade crossing signs, signals and protective devices, together with the proper action to be taken upon observing them. Any operator reported for disregarding the warnings or driving too fast over a railroad crossing should be required to take a new examination. Reckless disregard of the principles of safe driving at railroad crossings or a second or third repetition of fast driving over a crossing, should be punished by a suspension of license and in flagrant cases, a loss of driving privileges.

Upwards of $26,000,000 has been spent for train control devices intended to prevent accidents which took toll of 413 killed and 3,135 injured in the five years ending January 1, 1927. Twenty times as many were killed and nine times as many injured at highway-railroad grade crossings during the same period.

Without attempting any explanation of why accidents happen at grade crossings, I have tried to show that they do happen far too frequently, despite the expensive safeguards set up to warn the highway users. It is my belief that our effort should be directed toward standardizing the railroad highway grade crossing signs, decreasing the number of unprotected or part time protected crossings, restricting the horizontally flashing-light signal to use only at railroad crossings for indicating the approach of a train, educating the public in the correct observance of safety habits at these dangerous places, urging punishment for reckless or careless driving over a railroad grade crossing, and enacting suitable legislation intended to prevent the construction of any more crossings at grade of a railroad and highway.

Looking Backward

Fifty Years Ago

The new bridge of the Chicago & Alton over the Missouri river at Glagow, Mo., will be one of the first bridges in the United States to be constructed of steel.—*Chicago Railway Review*, September 30, 1878.

The Quebec, Montreal, Ottawa & Occidental [now part of the Canadian Pacific] which is now in operation from Quebec nearly to Montreal and from Montreal up the Ottawa river to Hull, opposite Ottawa, was seized by agents of the Quebec government on August 31 after the contractor had refused to turn it over to the government until a settlement of some $400,000 should be made.—*Railway Age*, September 19, 1878.

The percentage of the total quantity of grain brought into New York from August 5 to September 3, which was carried by the railroads, varied during different weeks from 71 per cent to 36 per cent. In the eight weeks the railroads handled an average of 57 per cent of the inbound grain each week and the canal 43 per cent.—*Railroad Gazette*, September 20, 1878.

Twenty-Five Years Ago

The New York Central has placed in service an apparatus whereby a single wire can be used simultaneously for both telegraph and telephone messages between Utica, N. Y., and Albany.—*Railway Age*, September 25, 1903.

L. C. Gilman has been appointed chief western counsel for the Great Northern at Seattle, Wash. J. R. W. Davis, formerly engineer of maintenance of way of the Erie, has been appointed enginer of maintenance of way of the Great Northern.—*Railway Age*, September 25, 1903.

Passenger men will be gratified with an example showing that it is sometimes the "ornamental" passenger department which saves the day when the "money earner," as the freight men like to call their end of the business, is temporarily under a cloud. The freight earnings of the Chesapeake & Ohio in the past fiscal year fell off $323,000, owing to the coal strike, while operating expenses increased $654,230. The passenger earnings at the same time increased 18 per cent, reducing the decrease in gross income to $413,064.—*Railway Age*, September 25, 1903.

Ten Years Ago

The annual report of the Union Pacific for 1917 shows that about one-fifth of its total income is derived from its banking operations and the other four-fifths from the operation of the 7,987 miles of railroad which make up the Union Pacific System.—*Railway Age*, September 20, 1918.

A plan has been outlined by the Railroad Administration for the re-organization of the Boston & Maine, which provides for a loan by the government of $20,000,000 in addition to the $10,000,000 already advanced by the government and for a consolidation of the leased lines with the Boston & Maine itself. A provision in the federal plan forbids the payment of dividends by the Boston & Maine common stock during the next five years.—*Railway Age*, September 20, 1918.

Martin W. Clement, superintendent of the New York, Philadelphia & Norfolk [now part of the Pennsylvania], was on September 1 promoted to superintendent of freight transportation of the Pennsylvania. J. B. Munson, vice-president and general manager of the Georgia, Southern & Florida, has been elected vice-president of the Southern, with headquarters at Cincinnati, Ohio, and F. S. Wynn, secretary of the Southern, has been promoted to secretary and treasurer, with headquarters at New York. C. W. Bunn, general counsel of the Northern Pacific, has been elected vice-president and general counsel.—*Railway Age*, September 20, 1918.

Books & Letters

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Montana—Resources and Opportunities. "Transportation in Montana—From the Dog Travois to the Air Mail in Seventy-Five Years—Seven Thousand Miles of Steel Rails in 1928," p. 45-54. Illustrations, many in colors. Map. 320 p. Pub. by Montana Department of Agriculture, Labor and Industry, Division of Publicity, Helena, Montana.

Report on the System of Accounting, Audit and Statistics of the Railways Owned and Managed by the Government of India, 1926-27, by Sir A. Lowes Dickinson. Part I deals with accounts and statistics in the de Rhe-Philipe and Acworth reports, the organization for accounting and statistical departments and for the government audit, and the proposed new systems and forms. Part II contains appendices referred to in Part I and Part III the forms for use in the new systems recommended in report and detailed in the Appendices. Published by the Railway Board, Government of India, Delhi, India. Part I, 4 shillings sixpence; Part II, 7 shillings sixpence, Part III, 10 shillings, sixpence.

Periodical Articles

Second-Class Sleeping-Car Service Inaugurated on French Railroads, by Louis Hall. Floor plan and elevation of cars. Commerce Reports, September 17, 1928, p. 721.

Newark Bay Bridge of the Central Railroad Company of New Jersey, by J. J. Yates. "This bridge reduced interruptions to rail traffic seventy-four per cent even though the marine traffic increased in comparison to previous years." Ed. Note. Journal of the Western Society of Engineers, September 1928, p. 456-464.

A Communication
L. & N. Pension Plan

LOUISVILLE, KY.

TO THE EDITOR:

There has just been brought to my attention an editorial in the *Railway Age* of September 1 regarding the "Unique Pension Plan" being proposed for the employees of the L. & N. Railroad Company.

I note that the editorial speaks of a "contributory plan," and, "That the railroad participates to a very considerable extent" in the arrangement.

You have evidently been misinformed as to this proposition, because the above statements are at variance with the actual facts. The pension plan referred to is one recently effected between the L. & N.'s Veterans' Club and the Inter-Southern Life Insurance Company of Louisville, Ky., for a pension or annuity provision. The plan is aside from, and wholly independent of the voluntary practice which has been in force in favor of this company's superannuated employees since 1901, and it has been undertaken by the Veteran's Club on its own initiative and responsibility. The L. & N. Railroad Company has had nothing to do with either its development or the work of putting it into effect, and, if and when it becomes effective this company will not contribute in any way towards the payment of premiums required. The only connection whatsoever that the L. & N. Railroad Company has had, or will have, with the consummation, or perpetuation of the plan is our agreement to make stoppages on the payroll for the benefit of the plan when it may become operative.

You may wish to give publicity to this in order to correct the previous statements as well as to forestall any inquiry from others who might be interested in the railway pension question.

G. E. EVANS,
Executive Vice-President, Louisville & Nashville.

Odds and Ends of Railroading

It is evident that the old-fashioned gentleman who deplores the lack of spanking these days has never passed through any of the turnstiles that have been installed in many railroad suburban stations. Quite a few travellers report that some of these turnstiles have a "follow through" that is often startling. It is believed, however, that this feature of turnstile operation is only a parting gesture of good will like a slap on the back, but somewhat lower down.

Do You Know That—

William R. Kenan, Jr., besides being president of the Florida East Coast, is a Jersey breeder of considerable fame. His cow, Sophie's Emily, is rated as the leading living cow for lifetime production, and he has several others of almost equal fame. W. H. Williams, chairman of the board of the Missouri Pacific and executive officer of other railways, is also an enthusiastic and successful stock-breeder, with several famous prize-winners in his barns.

Murder?

It is easy to imagine how alarmed we were to find in the September 12, 1878, issue of the *Railway Age* this announcement:

"We have taken the lives of a number of general ticket and passenger agents in a summary way on page 455, and hope to have the pleasure of doing the same thing by a number more."

But no crime had been committed because page 455 was filled with brief sketches recounting the railway experience of those officers attending a meeting of the general ticket and passenger agents association.

The Broad-Gage Elephant

Some 50 years ago, before all narrow-gage railroad men were convinced that a narrow-gage would not be the universal gage for railroads in the United States, all sorts of wiles were used to persuade men with money to become backers of narrow-gage roads. The Chicago Railway Review in 1878 related how the superintendent of construction of the St. Joseph & Des Moines, which is now a part of the Chicago, Burlington & Quincy, took a party over the 10 miles of the line on which iron had been laid and treated them to lunch and poetry. History has not preserved the menu of that lunch but this was the poetry:

"What! Send an elephant for a pony's load,
To eat his head off on a broad-gage road?
That day is past;—one-third the cost will do,
To equip a narrow-gage and put it through.
One-third their charge will yield big dividends,
And make all men along the line our friends.

"Now what we need is lower transportation,
To make all business thrive throughout the nation.
As sources of all wealth came from production,
Farmers cannot stand this broad-gage suction."

Dog-Power Railroad

Running north from Nome, Alaska, for about eighty miles across Seward peninsula, is the most remarkable railroad in the world. Its motive power is supplied by dogs. Of ordinary narrow-gage construction, it was built between 1900 and 1906 to carry supplies to the mines north of Nome. Twenty-pound rails were laid on ties placed across slabs piled on the tundra. Proper ballasting was impossible in most places and knuckle-jointed locomotives were used to overcome the unevenness of the track. By 1911, the richest and most productive gold deposits on the peninsula had been worked out. There was not sufficient traffic for the railroad; and service was discontinued. The locomotives and cars were allowed to gather rust on sidings, and for years the track lay neglected in the tundra grass. But not entirely neglected. Dog drivers built some flange-wheeled cars and today the abandoned track is a well-traveled thoroughfare. The dogs supply the motive power. With a half dozen dogs, two men can make 40 or 50 miles a day with ease. With more dogs, and traveling slower, considerable loads of freight can be transported. Two years ago the territorial government bought the line and right-of-way and it is now being put in repair especially for the use of dog teams.

Another Historic Bell

The bell of the Effie Afton, the side wheel packet that involved Abraham Lincoln in the legal aftermath of its collision with the Chicago & Rock Island bridge over the Mississippi river between Davenport, Iowa, and Rock Island, Ill., 72 years ago, was pulled from the water on July 3, 1928, by the crew of a government dredge engaged in deepening the river channel, according to the Rock Island Magazine. Prompted, no doubt, by reports that the 700-lb. bell contained as much as 10 per cent of silver the crew of the dredge disposed of it to a junk dealer who had broken it in pieces with a sledge hammer before it was finally placed by Major C. L. Hall, chief of the United States district engineers, in the custody of John B. Gordon, Rock Island superintendent.

The Effie Afton, it might be explained, crashed into the Rock Island bridge on its first trip up the Mississippi, on May 8, 1856, stoves were overturned, the boat burned to the water line and with it the draw span of the bridge. The following year a group known as the "River Interests" brought suit against the bridge company for damages to the packet with the purpose of condemning the bridge as a public nuisance. Lincoln handled the case for the railroad, the jury disagreed and the case found its way to the United States Supreme Court. The court decided the case for the defendant in 1862, establishing a precedent which silenced the protests of those who opposed the construction of railway bridges over navigable rivers.

Some Locomotive!

Whenever anyone in the lumbering business wishes to tell a "whopper," he claims that it happened to Paul Bunyan. There is no counterpart of Paul in the railway business, but many have no doubt heard the tale that has been told in many sandhouses from coast to coast of the sizeable locomotive. For those who have not seen a description of this remarkable engine, here it is:

"It has five acres of grate bars, four acres of netting in the smoke-box and it takes a man a day and half to walk through the cylinders. Every time the engine exhausts, it rains for 20 minutes afterwards. There is an elevator that goes to the headlight to hoist oil and it requires five barrels to fill it. It takes two men 45 minutes to light one signal lamp. The engineer has a searchlight to watch for signals and after running six months, goes blind. The glare of the headlight can be seen through hills a mile and a half thick. It took two carpenters four months to build the pilot. They use a steam shovel to give her coal, the tank holds 27 carloads, and every time they wash the boiler it is necessary to drain the Gulf of Mexico, and transportation is held up for several days. The pony wheels are as large as an ordinary turntable and the enginehouse forces hold a picnic each year in the firebox. She carries 850 lbs. of steam in her boiler and 360 lbs. of air in her train line. She can haul 722 loads in good weather and 72 in bad weather. She runs from Atlanta to New Orleans, a distance of 475 miles, and makes a trip in two hours and eleven minutes. When she leaves the track there is an earthquake in California four days later. The throttle is pulled by a stationary engine in the cab. The lubricator holds four barrels of oil and the train goes so fast that when she stops she is still running 10 miles an hour."

NEWS *of the* WEEK

THE NEW YORK, CHICAGO & ST. LOUIS VETERANS' ASSOCIATION, held its annual reunion at Cedar Point, Ohio, on September 1. The more than 1,000 men and women participating were transported to Sandusky on special cars which came from St. Louis, Chicago and Buffalo, and were ferried across Sandusky bay to Cedar Point.

T. J. BROWN, chairman of the Missouri Public Service Commission has resigned to engage in the practice of law at Jefferson City and Commissioner Almon Ing has succeeded to the chairmanship. J. Perry Painter, assistant counsel for the commission, has been appointed a member of the board.

Superintendent Reports Epidemic

A general superintendent who circularizes employees every month told them recently the following:

"There has been an epidemic of avoidable, painful injuries due to windows falling in coaches. Some of them have been caused by passengers not pushing the window up far enough to properly catch; others by defective catches. A glance at the window catch by trainmen when walking through cars, and the necessary action, would help very materially to eliminate these painful injuries. A defective catch should be reported at once and means taken to protect passengers in the meantime."

Western Railway Club Starts Forty-Fourth Year

The board of directors of the Western Railway Club, at the opening meeting of its forty-fourth year, at Chicago on September 17, elected R. M. Anderson, superintendent of motive power of the Chicago, Milwaukee, St. Paul & Pacific, first vice-president to succeed J. T. St. Clair who has resigned from railway service. L. R. Wink, assistant superintendent of the car department of the Chicago & North Western, was elected second vice-president and C. T. Ripley, chief mechanical engineer of the Atchison, Topeka & Santa Fe, was elected a member of the board of directors. Samuel O. Dunn, editor of *Railway Age*, delivered an address on the subject, "Where Are the Railways Heading?"

Asks Change in Time Zones

The Minneapolis, St. Paul & Sault Ste. Marie has petitioned the Interstate Commerce Commission for a modification of the commission's standard time zone orders, to change its line from Flaxton, N. D., to Whitetail, Mont., from mountain time to central time. The petition says that to have both time zones in effect over its line causes confusion, particularly because the line of the Great Northern from Minot to Crosby, N. D., paralleling the Flaxton branch of the Soo for a considerable distance, is operated on central time.

Railroad Tax Cases

A suit filed by the Northern Pacific to compel 23 Washington counties to reduce the assessed valuations of its properties from a total of $131,000,000, throughout the state to $85,000,000 was taken under advisement by Ralph Kaufmann, special master in chancery, at Olympia, Wash., on September 6 after he had heard arguments by counsel for both sides for five weeks. The suit was begun in 1927 at the federal court at Spokane, Wash., and the taking of testimony has been in progress at various points throughout the state ever since. Final arguments in a similar suit brought by the Chicago, Milwaukee, St. Paul & Pacific are to be heard by Judge Kaufmann at Ellensburg, Wash., about October 1.

The State Tax Commission of Mississippi has increased the tax assessment of the buildings and structures of the Columbus & Greenville 50 per cent over the assessment in 1927. Recently the Mississippi Railroad Commission placed the C. & G. in its classification two instead of classification three, automatically increasing the privilege taxes from $10 to $25 per mile.

August Locomotive Shipments

August shipments of railroad locomotives, from principal manufacturing plants, based on reports received by the Department of Commerce, totaled 34 locomotives, as compared with 81 in August, 1927. The following table gives the shipments and unfilled orders of locomotives for August, 1927 and 1928, the 1927 totals and the totals for the first eight months of the two years.

RAILROAD LOCOMOTIVES

Year and Month	Shipments Total	Domestic Steam	Domestic Electric	Foreign Steam	Foreign Electric
1928					
August	34	23	4	7	..
Total (8 mos.)	394	257	85	50	2
1927					
August	81	71	6	4	..
Total (8 mos.)	711	487	109	108	7
Total (year)	1,074	726	148	171	29

	Unfilled Orders, End of August Total	Domestic Steam	Domestic Electric	Foreign Steam	Foreign Electric
1928	204	135	26	41	2
1927	363	244	68	30	21

Safety Program for October

"Struck or Run Over By Cars or Locomotives" is one of the items in the government accident records which all students of such records will recognize as an item never failing to hold a relatively prominent place; for, sad to say, railroad employees themselves and occasionally some of the oldest heads, are among the victims of the absent-mindedness or other mental fault which results in death or injury from this cause.

This topic is the feature of Safety-Section Circular No. 203, which has been issued by L. G. Bentley, chairman, proposing this subject for special study and emphasis during the month of October. While the number of employees injured per million man-hours (from all causes) has been reduced in a gratifying way since the beginning of the campaign, in 1923—from 30.50 to 16.76—the reduction in the percentage of persons killed is not nearly so favorable, the number killed per million man-hours having been as follows:

Period	Killed
Year 1923	.38
Year 1924	.31
Year 1925	.33
Year 1926	.34
Year 1927	.32
Four Months, 1928	.32

(Continued on page 568)

Operating Statistics of Large Steam Railways—Selected Items for July, 1928, Com

Region, road and year	Average miles of road operated	Locomotive-miles: Train-miles	Locomotive-miles: Principal and helper	Locomotive-miles: Light	Car-miles: Loaded (thousands)	Car-miles: Per cent loaded	Ton-miles (thousands): Gross. Excluding locomotives and tenders	Ton-miles (thousands): Net. Revenue and non-revenue	Average number of locomotives on line: Serviceable	Unserviceable	Per cent unserviceable	Stored
New England Region:												
Boston & Albany....1928	407	183,070	194,733	20,366	4,906	67.8	249,023	91,747	94	27	22.2	30
1927	407	193,459	206,857	21,918	4,930	65.4	256,931	93,070	108	16	12.8	6
Boston & Maine....1928	2,074	378,789	446,402	56,735	12,018	71.5	591,624	229,019	270	55	17.0	57
1927	2,075	464,967	526,492	49,502	11,865	70.7	599,295	240,113	274	75	21.6	31
N. Y., New H. & Hart...1928	2,122	538,291	599,701	34,971	16,072	66.8	850,819	334,238	304	55	15.2	44
1927	2,140	585,277	634,870	36,367	16,181	66.5	858,351	345,401	323	64	16.5	49
Great Lakes Region:												
Delaware & Hudson....1928	875	299,476	402,371	47,577	9,252	63.8	552,225	251,812	250	37	12.8	111
1927	875	339,392	454,091	48,936	9,680	61.9	612,412	295,393	249	34	12.0	87
Del., Lack. & Western...1928	998	470,849	523,669	59,529	15,423	68.8	837,067	340,375	252	53	17.4	46
1927	999	523,708	593,768	71,957	16,752	68.1	921,461	382,523	265	45	14.6	39
Erie (inc. Chi. & Erie)....1928	2,317	868,246	939,057	81,902	37,281	63.5	2,187,565	859,118	409	117	22.3	46
1927	2,317	929,116	993,704	76,827	35,933	63.3	2,146,113	868,714	413	178	30.1	34
Lehigh Valley 1928	1,346	519,021	567,193	56,236	16,436	64.1	973,669	414,115	336	95	22.1	71
1927	1,345	506,813	552,023	62,439	15,631	65.7	893,592	378,751	357	97	21.4	61
Michigan Central 1928	1,822	535,252	552,395	20,210	18,794	61.4	1,053,977	372,718	205	65	24.2	35
1927	1,820	562,082	577,140	23,309	18,802	60.2	1,060,670	376,614	238	61	20.4	63
New York Central....1928	6,459	1,916,060	2,135,015	153,971	74,370	62.1	4,481,021	1,883,593	1,024	366	26.3	283
1927	6,478	1,829,654	2,045,145	136,997	72,049	62.6	4,330,853	1,852,807	1,126	271	19.4	385
New York, Chi. & St. L..1928	1,665	571,725	578,825	6,517	19,300	63.3	1,079,917	399,977	231	54	19.0	74
1927	1,665	596,989	606,242	5,818	20,282	63.9	1,118,647	412,544	235	52	18.0	60
Pere Marquette 1928	2,181	428,075	431,685	5,263	11,156	62.5	670,562	288,811	177	37	17.4	14
1927	2,180	430,852	436,186	5,573	11,027	64.1	642,672	274,485	180	38	17.6	11
Pitts. & Lake Erie....1928	231	113,313	116,000	1,698	4,162	60.7	347,842	198,664	53	19	25.7	12
1927	231	113,931	115,872	1,580	4,589	63.2	367,852	215,499	55	21	27.2	12
Wabash 1928	2,497	779,754	810,942	12,700	24,172	64.4	1,363,677	514,247	302	56	15.7	57
1927	2,497	690,058	721,423	10,650	20,882	65.3	1,156,742	432,010	333	49	12.8	80
Central Eastern Region:												
Baltimore & Ohio....1928	5,534	1,853,937	2,193,706	176,262	55,737	61.2	3,731,278	1,749,510	1,010	252	20.0	180
1927	5,540	1,970,942	2,283,844	202,639	57,297	61.5	3,825,363	1,824,865	1,049	217	17.1	130
Central of New Jersey....1928	691	244,837	264,465	43,625	7,106	59.6	457,686	208,776	175	38	17.7	29
1927	691	248,973	274,824	46,012	7,332	59.0	475,796	222,918	186	32	14.7	27
Chicago & Eastern Ill.....1928	945	240,389	240,941	3,642	6,478	65.4	374,640	160,605	113	57	33.4	48
1927	945	266,033	273,986	3,504	7,060	62.4	431,574	192,211	127	46	26.5	50
Clev., Cin., Chi. & St. L...1928	2,370	719,830	745,872	16,468	22,782	61.4	1,471,212	656,629	336	108	24.4	64
1927	2,374	723,864	754,950	20,089	22,950	60.0	1,498,642	679,099	341	96	22.0	50
Elgin, Joliet & Eastern....1928	461	123,635	130,567	5,025	3,593	64.6	263,957	135,328	79	10	11.3	4
1927	461	124,014	130,420	4,657	3,503	64.2	253,393	133,370	77	14	15.5	3
Long Island 1928	396	48,178	48,683	12,177	527	54.8	35,507	13,759	60	9	12.9	...
1927	393	44,646	47,816	12,925	544	54.6	36,706	14,321	47	10	17.2	...
Pennsylvania System 1928	10,758	3,975,391	4,521,641	394,901	139,742	64.4	9,001,315	4,104,354	2,772	347	11.1	768
1927	10,844	4,391,729	4,866,645	383,545	140,100	63.7	9,063,381	4,144,386	2,864	403	12.3	661
Reading 1928	1,128	541,708	598,011	43,044	15,256	59.7	1,058,791	517,109	307	80	20.7	73
1927	1,131	581,976	627,926	58,848	15,245	59.4	1,062,090	522,038	322	77	19.2	71
Pocahontas Region:												
Chesapeake & Ohio....1928	2,723	1,049,947	1,126,808	40,643	35,550	56.2	2,881,491	1,545,834	543	95	14.8	106
1927	2,702	1,164,610	1,251,261	47,822	38,967	56.7	3,141,510	1,700,119	548	90	14.1	48
Norfolk & Western....1928	2,231	819,735	951,237	29,383	30,622	57.5	2,568,340	1,364,027	524	50	8.8	166
1927	2,232	841,460	1,017,388	37,184	29,411	58.1	2,521,813	1,303,345	562	50	8.1	155
Southern Region:												
Atlantic Coast Line....1928	5,127	609,505	611,586	8,399	15,569	59.0	864,139	303,988	440	52	10.5	96
1927	5,090	648,568	653,912	10,525	16,604	59.4	955,267	361,357	424	56	11.7	101
Central of Georgia....1928	1,898	341,486	344,712	7,074	7,753	64.7	428,923	153,585	149	18	10.7	5
1927	1,898	339,104	345,246	8,182	7,857	68.5	419,579	165,992	144	19	11.7	12
Ill. Cent. (inc. Y. & M. V.)1928	6,738	1,845,466	1,863,485	29,450	50,701	61.8	3,244,431	1,319,973	761	97	11.3	56
1927	6,594	2,007,664	2,030,901	47,849	53,556	60.9	3,521,876	1,507,753	785	102	11.5	6
Louisville & Nashville....1928	5,061	1,666,675	1,735,944	59,578	35,901	59.3	2,434,967	1,141,936	606	103	14.5	61
1927	5,048	1,745,187	1,810,466	60,457	37,890	59.3	2,607,044	1,245,504	628	106	14.4	38
Seaboard Air Line....1928	4,485	536,125	554,370	5,995	13,182	61.1	754,352	276,785	269	60	18.3	19
1927	4,295	542,468	549,988	5,291	13,317	62.3	760,917	294,431	239	49	17.1	36
Southern 1928	6,718	1,544,583	1,575,793	32,655	37,372	62.3	2,103,398	809,763	876	101	10.3	147
1927	6,718	1,508,328	1,533,001	31,862	37,401	64.6	2,048,927	800,224	839	112	11.8	43
Northwestern Region:												
Chi. & North Western....1928	8,463	1,406,167	1,478,373	23,043	36,674	62.3	2,194,988	861,514	754	135	15.2	100
1927	8,463	1,377,360	1,426,382	25,022	34,085	61.1	2,045,793	798,893	731	147	16.8	92
Chi., Milw., St. P. & Pac..1928	11,248	1,636,132	1,751,327	106,507	50,000	62.9	2,948,648	1,225,076	796	124	13.4	167
1927	11,202	1,610,414	1,708,819	102,646	47,564	60.9	2,812,745	1,127,952	778	162	17.2	153
Chi., St. P., Minn. & Om..1928	1,724	291,054	310,122	12,840	6,193	65.7	339,576	135,832	150	30	16.5	23
1927	1,724	279,672	297,375	12,679	5,920	66.7	326,603	130,270	166	32	16.1	28
Great Northern 1928	8,305	804,910	829,737	60,792	29,987	64.8	1,847,137	890,685	510	132	20.6	81
1927	8,164	767,676	790,245	47,242	28,643	61.4	1,803,123	832,886	541	147	21.4	127
Minn., St. P. & S. Ste. M.1928	4,358	476,828	491,931	5,455	13,056	65.4	706,080	300,768	206	38	15.5	20
1927	4,368	502,921	520,084	5,366	13,441	65.8	742,496	331,378	287	35	10.9	12
Northern Pacific 1928	6,415	828,065	877,975	50,283	26,547	68.9	1,486,605	629,782	413	152	26.9	29
1927	6,476	790,090	833,761	42,268	24,678	69.7	1,335,549	565,400	467	150	24.3	79
Oreg.-Wash. R. R. & Nav..1928	2,246	205,910	216,153	14,545	5,777	67.9	341,749	151,694	124	19	13.4	3
1927	2,154	191,032	200,950	13,748	5,468	70.0	312,821	141,148	133	15	10.2	11
Central Western Region:												
Atch., Top. & S. Fe (In-1928	10,454	1,863,154	2,042,172	111,321	62,710	62.4	3,916,165	1,497,336	791	130	14.1	139
cluding P. & S. F.)....1927	10,404	1,617,184	1,769,249	99,462	53,924	65.7	3,179,190	1,221,041	781	159	16.9	141
Chicago & Alton....1928	1,000	310,376	346,462	3,541	7,729	64.9	459,198	161,336	115	37	24.1	13
1927	995	304,499	329,122	2,668	7,106	58.2	443,937	157,837	137	19	12.1	40
Chi., Burl. & Quincy....1928	9,317	1,372,400	1,420,709	53,333	43,027	64.9	2,474,717	1,122,124	733	159	17.8	78
1927	9,334	1,357,120	1,414,242	66,704	40,676	65.7	2,273,279	1,008,927	742	177	19.3	72
Chi., Rock I. & Pacific...1928	7,566	1,557,879	1,666,001	19,458	39,814	65.8	2,341,690	1,002,397	574	103	15.2	35
1927	7,575	1,397,983	1,479,302	12,841	36,537	65.3	2,094,019	857,699	554	116	17.3	46
Denver & R. G. Wn.....1928	2,563	222,238	254,959	40,820	6,594	70.1	367,213	164,572	227	41	15.1	36
1927	2,571	222,224	263,907	48,511	6,394	69.5	374,467	176,570	223	46	16.9	27
Oregon Short Line....1928	2,539	273,501	290,506	24,932	8,031	67.0	469,546	201,099	152	26	14.4	21
1927	2,539	264,838	282,951	26,452	7,614	68.0	441,240	193,546	172	25	12.7	52
So. Pacific—Pacific Lines..1928	8,740	1,676,458	1,824,529	272,680	52,850	62.8	3,206,022	1,127,861	730	187	20.4	53
1927	8,754	1,576,230	1,709,954	262,594	49,030	63.9	2,976,137	1,076,728	730	184	20.1	64
Union Pacific 1928	3,715	1,025,999	1,051,193	53,673	39,284	63.0	2,309,082	789,873	387	64	14.1	98
1927	3,714	854,360	873,417	37,511	32,730	63.2	1,927,880	694,764	435	51	10.4	168
Southwestern Region:												
Gulf, Colo. & S. Fe....1928	1,933	252,233	261,049	5,722	8,242	66.0	519,809	244,343	132	18	11.9	45
1927	1,933	362,800	375,353	10,134	11,238	59.1	758,791	342,353	140	24	14.7	20
Mo.-Kans.-Tex. Lines....1928	3,176	489,438	509,904	18,893	16,252	59.1	999,351	400,645	207	41	16.6	70
1927	3,176	425,497	433,050	10,719	13,741	59.1	830,625	325,450	212	31	12.9	95
Missouri Pacific 1928	7,433	1,385,543	1,434,554	48,717	40,779	65.2	2,417,809	1,033,987	553	93	14.4	29
1927	7,321	1,289,522	1,334,526	42,904	36,478	64.8	2,155,318	926,318	551	83	13.1	33
St. Louis-San Francisco...1928	5,076	850,430	864,038	12,059	20,521	61.5	1,257,522	594,499	398	47	10.6	50
1927	4,860	750,375	766,002	9,145	18,601	61.4	1,120,611	462,600	401	57	12.4	81
Texas & New Orleans....1928	4,708	763,798	767,731	2,278	16,592	66.3	961,392	389,887	266	71	21.1	38
1927	4,570	712,760	717,864	1,243	15,857	67.4	922,802	391,396	255	62	19.5	41
Texas & Pacific....1928	2,015	580,975	580,975	9,729	15,083	57.6	1,005,799	390,715	199	16	7.6	16
1927	1,954	368,317	368,317	2,921	9,268	57.4	589,158	206,955	177	20	10.2	27

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

pared with July, 1927, for Roads with Annual Operating Revenues above $25,000,000.

Region, road and year	Average number of freight cars on line: Home	Foreign	Total	Per cent unserviceable	Gross ton-miles per train-hour, excluding locomotives and tenders	Gross tons per train, excluding locomotives and tenders	Net tons per train	Net tons per loaded car	Net ton-miles per car-day	Car miles per car-day	Net ton-miles per mile of road per day	Pounds of coal per 1,000 gross ton-miles, including locomotives and tenders	Locomotive miles per locomotive-day
New England Region:													
Boston & Albany.....1928	2,515	4,939	7,454	4.1	19,268	1,360	501	18.7	397	31.3	7,271	154	57.2
1927	3,245	4,685	7,930	3.5	18,133	1,328	481	18.9	379	30.7	7,376	164	59.6
Boston & Maine.....1928	12,225	10,481	22,706	5.5	18,134	1,562	605	19.1	325	23.9	3,562	107	50.0
1927	13,906	11,243	25.149	7.0	14,670	1,289	516	20.2	308	21.5	3,733	114	53.2
N. Y., New H. & Hart..1928	17,497	16,335	33,832	8.4	20,755	1,581	621	20.8	319	23.0	5,081	105	57.1
1927	23,177	17,653	40,830	16.4	18,802	1,467	590	21.3	273	19.2	5,207	110	55.9
Great Lakes Region:													
Delaware & Hudson.....1928	9,933	5,040	14,973	4.3	22,729	1,844	841	27.2	543	31.2	9,283	132	50.6
1927	9,427	5,518	14,945	4.4	22,383	1,804	870	30.5	638	33.8	10,888	143	57.5
Del., Lack. & Western...1928	18,429	6.666	25,095	4.3	22,442	1,778	723	22.1	438	28.8	11,003	121	61.7
1927	18,063	7,087	25,150	3.6	21,831	1,759	730	22.8	491	31.6	12,348	119	69.2
Erie (inc. Chi. & Erie)..1928	31,530	17,954	49,484	4.1	32,818	2,520	989	23.0	560	38.3	11,962	109	62.6
1927	36,178	18,493	54,671	6.4	27,324	2,310	935	24.2	513	33.5	12,093	122	58.4
Lehigh Valley 1928	24,363	8,986	33,349	12.9	26,462	1,876	798	25.2	401	24.8	9,925	139	46.7
1927	23.351	7,864	31.215	11.1	24,874	1,763	747	24.2	391	24.6	9,081	141	43.6
Michigan Central 1928	19,952	15,409	35,361	4.9	31,260	1,969	696	19.8	340	27.9	6,599	98	68.5
1927	17,693	15,282	32,975	4.4	28,384	1,887	670	20.0	368	30.6	6,677	101	64.8
New York Central.....1928	70,700	69,169	139,869	6.5	31,432	2,339	983	25.3	434	27.6	9,407	97	53.1
1927	72,308	69,347	141,655	4.2	29,652	2,367	1,013	25.7	422	26.2	9,226	101	50.4
New York, Chi. & St. L..1928	14,587	9.287	23,874	5.7	27.225	1,889	700	20.7	540	41.2	7,750	97	66.2
1927	14,368	10.622	24,990	6.1	26,051	1,874	691	20.3	533	41.0	7,993	100	68.8
Pere Marquette.....1928	11,185	8,163	19,348	4.0	20,317	1,566	675	25.9	482	29.8	4,272	93	65.9
1927	10,131	9,313	19,444	4.0	18,806	1,492	637	24.9	455	28.6	4,061	96	65.2
Pitts. & Lake Erie.....1928	15,814	7,193	23,007	4.9	34,781	3,070	1,753	47.7	279	9.6	27,710	94	53.1
1927	14,173	7,113	21.286	4.0	35,020	3,229	1,891	47.0	327	11.0	30,034	85	50.0
Wabash 1928	15,913	11,909	27,822	2.9	28,808	1,749	659	21.3	596	43.5	6,643	107	74.2
1927	16,976	10,913	27,889	2.8	27,191	1,676	626	20.7	500	37.0	5,581	116	61.8
Central Eastern Region:													
Baltimore & Ohio.....1928	75,453	28,378	103,831	5.6	23,642	2,013	944	31.4	544	28.3	10,197	134	60.6
1927	76,588	32,025	108,613	4.9	21,439	1,941	926	31.9	542	27.7	10,626	141	63.4
Central of New Jersey...1928	19,157	10.222	29,379	4.2	20.781	1,869	853	29.4	229	13.1	9,746	140	46.8
1927	19,156	10.495	29,651	4.2	19,841	1,911	895	30.4	243	13.5	10,408	147	47.6
Chicago & Eastern Ill...1928	13,603	3,823	17,426	32.1	22,868	1,558	668	24.8	297	18.3	5,482	123	46.4
1927	14,334	5,014	19,348	23.0	23,083	1,622	723	27.2	320	18.8	6,560	130	51.7
Clev., Cin., Chi. & St. L.1928	24,186	19,736	43,922	4.3	27,941	2,044	912	28.8	482	27.2	8,936	108	55.4
1927	20,417	20,953	41.370	5.4	26,551	2,070	938	29 6	530	29.8	9,228	111	57.2
Elgin, Joliet & Eastern...1928	9,416	6,692	16.108	5.7	16,255	2,135	1,095	37.7	271	11.1	9,478	115	49.1
1927	9,407	6,535	15,942	5.3	15,030	2,043	1,075	38.1	270	11.0	9,332	128	47.9
Long Island 1928	1,672	3,785	5,457	1.3	4,779	737	286	26.1	81	5.7	1,121	291	28.5
1927	1,814	4,407	6,221	1.5	4.700	822	321	26.3	74	5.2	1,175	260	34.8
Pennsylvania System 1928	220,970	81.555	302,525	6.5	26.729	2.264	1,032	29.4	438	23.2	12,308	114	50.8
1927	221,291	82,054	303,345	6.0	23.589	2,064	944	29.6	441	23.4	12,328	116	51.8
Reading 1928	28,995	11,071	40,066	5.9	22,546	1,955	955	33.9	416	20.6	14,787	135	53.4
1927	28,262	11,433	39,695	2.9	20,825	1,825	897	34.2	424	20.8	14,887	144	55.6
Pocahontas Region:													
Chesapeake & Ohio.....1928	31,207	8,751	39,958	3.1	34,438	2,744	1,472	43.5	1,248	51.1	18.310	83	59.1
1927	30,153	13,366	43 519	3.0	31,492	2.697	1,460	43.6	1,260	50.9	20,295	88	65.7
Norfolk & Western.....1928	30,677	8,333	39.010	1.3	43,776	3,133	1,664	44.5	1,128	44.0	19,719	116	55.0
1927	30,425	8,815	39,240	1.3	40,226	2,997	1,549	44.3	1,071	41.6	18,840	123	55.6
Southern Region:													
Atlantic Coast Line.....1928	21,261	6,706	27,967	6.0	20,292	1,418	499	19.5	351	30.4	1,913	104	40.6
1927	21,835	7,552	29,387	5.2	19,819	1,473	557	21.8	397	30.7	2,290	106	44.6
Central of Georgia.....1928	5,341	6.418	11,759	2.7	17.707	1.256	450	19.8	421	32.9	2.611	130	68.0
1927	4,770	6,436	11,206	3.0	17,332	1,237	450	21.1	478	33.0	2,822	136	69.9
Ill. C. (inc. Y. & M. V.).1928	44,223	19,847	64,070	7.7	24,505	1,758	715	26.0	665	41.3	6,319	120	71.2
1927	42,683	24,430	67,113	8.0	23,516	1,754	751	28.2	725	42.2	7,376	115	75.6
Louisville & Nashville...1928	44,735	15,091	59,826	9.6	19,665	1,461	685	31.8	616	32.6	7,278	133	81.7
1927	43,194	17,915	61.109	10.5	18,293	1,494	714	32.9	657	33.7	7,958	134	82.3
Seaboard Air Line.....1928	14,952	6,555	21,507	7.9	18,508	1,407	516	21.0	415	32.4	1,991	128	55.0
1927	14,458	7,674	22,132	6.3	17,536	1,403	543	22.1	429	31.2	2,212	129	62.0
Southern 1928	48,650	16,061	64,711	8.5	19.323	1,362	524	21.7	404	29.9	3,888	146	53.1
1927	44,779	17,484	62,263	5.1	18,727	1,358	531	21.4	415	30.0	3,842	149	53.1
Northwestern Region:													
Chi. & North Western...1928	48,257	27.733	75,990	6.5	20.490	1,561	613	23.5	366	25.0	3.284	114	54.5
1927	49,582	29.413	78,995	8.3	18.603	1,485	580	23.5	326	22.8	3,045	119	53.3
Chi., Mil., St. P. & Pac..1928	47,823	23,511	71,334	3.4	23,484	1,802	749	24.5	554	36.0	3,513	116	65.2
1927	54,494	24,569	79,063	6.6	22.253	1,747	700	23.7	460	31.8	3,248	124	62.2
Chi., St. P., Minn. & Om.1928	2.601	8,518	11,119	7.1	14,903	1,167	467	21.9	394	27.3	2,542	112	57.9
1927	3.051	8,840	11 891	9.8	14,645	1,168	466	22.0	353	24.1	2,438	114	50.5
Great Northern 1928	41,055	9,871	50.926	5.5	28.543	2.295	1,107	29.7	564	29.3	3,460	112	44.7
1927	41,408	10,998	52.406	7.3	28.569	2,349	1,085	29.1	513	28.7	3,291	109	39.3
Minn., St. P. & S. Ste. M..1928	20,110	6,128	26,238	5.3	17.688	1,481	631	23.0	378	25.1	2,226	95	65.8
1927	20.688	6.910	27,598	4.7	17.411	1.476	659	24.7	395	24.3	2,447	96	52.6
Northern Pacific 1928	38.363	7 034	45.397	7.6	24.686	1,795	761	23.7	448	27.4	3,167	137	53.0
1927	38,388	6.857	45.245	8.1	23.692	1,690	716	22.9	403	25.3	2,816	130	45.8
Oreg.-Wash. R. R. & Nav.1928	8,366	4,668	13,034	6.2	21,105	1,660	737	26.3	375	21.1	2.179	154	52.2
1927	7,496	4,709	12,205	5.6	19,790	1,638	739	25.8	373	20.6	2,114	167	46.8
Central Western Region:													
Atch., Top. & S. Fe (in- 1928	61.520	24,534	86.054	4.9	30.021	2.102	804	23.9	561	37.7	4,620	100	75.4
cluding P. & S. F.)...1927	59.615	18,482	78 097	5.6	27.545	1.966	755	22 6	504	33.9	3,786	105	64.2
Chicago & Alton.....1928	10.601	4,373	14.974	4.1	22.202	1.479	520	20.9	348	25.6	5,206	122	74.5
1927	10.561	4,970	15.531	4.4	19.844	1.458	518	22.2	328	25.4	5.117	139	68.6
Chi., Burl. & Quincy....1928	48,067	20,040	68,107	5.6	23.988	1,803	818	26.1	531	31.4	3,885	114	53.3
1927	51.748	18.750	70,498	5.6	21.994	1.675	743	24.8	462	28.3	3.487	121	51.9
Chi., Rock I. & Pacific..1928	31,274	20 277	51.551	6.6	19.727	1,503	643	25.2	627	37.9	4,274	126	80.3
1927	32,922	20.994	53,916	6.0	19.177	1,498	614	23.5	513	33.5	3.653	116	71.9
Denver & R. G. Wn....1928	11,803	3.652	15,455	3.8	19.333	1.652	741	25.0	343	19.6	2,071	171	35.6
1927	11.109	4,440	15,549	2.5	17.597	1.685	795	27.6	366	19.1	2,215	175	37.
Oregon Short Line.....1928	7,101	4,071	11.172	5.3	24,185	1,717	735	25.0	581	34.6	2,555	105	
1927	7.971	5.352	13 323	5.2	23,104	1.666	731	25.4	469	27.1	2,459	112	9
Southern Pac.--Pac. Lines.1928	37.798	30.350	68.148	5.2	24.319	1,912	673	21.3	534	39.9	4,163	114	73.8
1927	34,976	29.837	64.813	5.3	23.583	1,888	683	22.0	536	38.2	3.968	116	69.6
Union Pacific 1928	24.166	10.157	34,323	8.1	38.673	2.251	770	20.1	742	58.6	6.859	98	79.2
1927	24,258	9,676	33,934	9.3	36,766	2.257	813	21.2	660	49.2	6,034	98	60.5
Southwestern Region:													
Gulf, Colo. & S. Fe.....1928	9,210	4.485	13.695	3.6	30.496	2,061	969	29.6	576	29.4	4,078	86	57.4
1927	9.908	6.268	16.176	3.9	30.163	2.092	944	30.5	683	38.0	5,713	88	75.9
Mo.-Kans.-Tex. Lines.....1928	16.716	7.845	24.561	6.6	28.359	2.042	819	24.7	526	36.1	4.069	89	68.7
1927	16.493	6,420	22.913	6.3	26.873	1,952	765	23.7	458	32.8	3,305	91	59.0
Missouri Pacific 1928	30.523	21,690	52.213	6.0	23.965	1,745	746	25.4	639	38.7	4,487	115	74.1
1927	30.834	19.496	50 330	4.8	22.102	1.671	718	25.4	594	36.1	4.082	118	70.2
St. Louis-San Francisco..1928	24.540	9,303	33.843	3.3	19.909	1,479	699	29.0	567	31.8	3,778	135	63.6
1927	22,488	8.745	31.233	3.6	20,086	1,493	616	24.9	478	31.3	3.071	137	54.7
Texas & New Orleans...1928	11.478	13.558	25.036	5.8	19.082	1,259	510	23.5	502	32.3	2.671	95	73.6
1927	11,769	14,468	26,237	5.8	18.456	1,295	549	24.7	481	28.9	2.763	100	73.4
Texas & Pacific.....1928	6,797	9.286	16.083	4.7	23.945	1,731	673	25.9	784	52.5	6,255	92	88.5
1927	6,469	5,179	11,648	5.4	22,741	1,600	562	22.3	573	44.8	3,416	98	60.8

News of the Week

(*Continued from page 565*)

The circular is illustrated by four original pen-sketches showing some of the most common faults of employees in this connection. The one simple preventive is: *Look both ways before stepping on a track.*

New Record Set in Fuel Efficiency

The greatest efficiency for any corresponding period on record in the use of fuel by road locomotives was attained by the Class 1 railroads of this country in the first six months of 1928, according to reports just filed by the railroads with the Interstate Commerce Commission.

An average of 131 pounds of fuel was required during the first six months of 1928 to haul 1,000 tons of freight and equipment, including locomotive and tender, a distance of one mile. This was the lowest average ever attained by the railroads since the compilation of these reports began in 1918, being a decrease of four pounds under the best previous record established in the first half of 1927.

The railroads, in the six months period this year, for every pound of coal or its equivalent used, hauled 7.6 tons of freight and equipment one mile.

In other words, for every 2.1 ounces of coal the railroads hauled an average of one ton of freight and equipment one mile.

Class 1 railroads in the first half of 1928 utilized for road locomotive fuel 46,225,638 tons of coal and 1,006,913,475 gallons of fuel oil.

Fifteen-Year Record of Long Trains

The news items recently printed in the *Railway Age* concerning long freight trains moved over a division of the Virginian, 123 miles long, by the heavy Mallet (2-10-10-2) locomotives of that road, recall other occasions on which long trains have been moved; and correspondents point out that the power of locomotives was thus tested as far back as 1914. While these older items do not in any way detract from the credit due the Virginian, in connection with its two recent performances—which are not so very far above everyday work on that road—they serve to give variety to the table printed below.

The locomotive which made the remarkable run on the Erie here described, was the well-known "triplex," built by the Baldwin Locomotive Works for the Erie. Eight of the 24 driving wheels were under the tender. In this run, pushers were used to assist in starting the train, to avoid breaking couplings; and a telephone line was extended over the train to facilitate communication between the rear end and the locomotive.

The run made by the New York, New Haven & Hartford was from New Haven, Conn., westward to Harlem River, N. Y., 67 miles, between which points electric locomotives are regularly run without a stop; but the distance given in the table, 48 miles, is that from New Haven to Rye, N. Y., at which point the long train broke in two; and, because of the frequent passenger trains on that line, it was deemed unwise to incur the delay necessary to recouple the train. The leading locomotives and 135 cars proceeded to Harlem River while the remainder of the train was moved by a following locomotive.

The Back Bay Station

The Department of Public Utilities of Massachusetts held a hearing in Boston on September 17, on the question whether an order should be issued calling for the construction of a union passenger station by the Boston & Albany and the New York, New Haven & Hartford at "Back Bay" about one mile west of the South station in Boston. The station of the New Haven road at this point was destroyed by fire a few months ago, and the company is proceeding to build a new one. The mayor of Boston and other citizens have voiced a demand that the two roads should join in the construction of a single station for the use of both, but, thus far, the most definite encouragement that they have received is the preparation of a plan by W. J. Keefe, chief engineer of the Department of Public Utilities. The New Haven road is said to be not unfriendly to the proposal, but the Boston & Albany is said to be indifferent or hostile. This road appears not to have been represented at the hearing.

The work thus far done by the New Haven has not been of such a character as to interfere with making the building a union station. The tracks of the two roads are adjacent at this point; the Boston & Albany on the north and the New Haven on the south. The westbound passenger station of the Boston & Albany (Trinity Place) is opposite the station of the New Haven while the eastbound Boston & Albany station (Huntington Avenue) is a short distance west. The New Haven expects to spend $450,000 and the estimated cost of the joint station proposed by Mr. Keefe is $1,008,000.

Railway Fire Protection Association

The Railway Fire Protection Association, W. H. Klinsick, (C. B. & Q.) president, will hold its annual meeting at Hotel Gibson, Cincinnati, O., on Tuesday, Wednesday and Thursday, October 9, 10 and 11. The business of the first day embraces committee reports on the following subjects, the name of the chairman being given following each subject:

Statistics, F. R. Bradford; Hand book, T. E. Chapman, Jr.; Standard fire hose, J. R. Peters; Conference with A. R. A. car painters, DeWitt Rapalje; grain elevators, George A. Bryant.

Second day, Wednesday. The first thing on the program Wednesday morning is an address on fire losses from locomotive sparks, by Professor L. W. Wallace. The committee reports scheduled are: Storage of records, J. L. Rice; Protection of company material, E. J. Reilly; Air compressors, H. W. Tinker; Fuel oil, W. A. Radspinner.

Third day, Thursday. Address by R. M. Clark, assistant manager, Insurance Department, U. S. Chamber of Commerce. Committee reports on rolling stock, W. J. E. Martel; A. R. A. motor transport division, W. H. Klinsick; National Fire waste council, B. S. Mace and E. B. Berry; A. R. E. A. rules on fire prevention, J. R. Peters.

Following these reports, ten members will present brief reports on ten subjects in connection with which they, as chairmen of committees, have represented the R. F. P. A. in the National Fire Protection Association. These ten are: Earl Moore, (C.P.R.); F. R. Bradford, (B. & M.); W. E. Cathcart, (Penn.); W. J. Alderton, (C. N. R.); G. R. Hurd, (Ill. Central); E. L. Tallichet, (Southern); E. H. Kent, (C. P. R.); W. F. Hickey, (N. Y., N. H. & H.); C. C. Michie, (C. & O.); E. B. Berry, (Southern).

The secretary of the Railway Fire Protection Association is R. R. Hackett (B. & O.), Baltimore, Md.

Western Wage Dispute at a Standstill

Negotiations for the settlement of the wage dispute between railroads in western territory and their trainmen and conductors, in accordance with a tentative agreement reached through the offices of the United States Board of Mediation, failed at Chicago on September 18. The agreement which was signed at Washington on August 28, by J. W. Higgins as chairman of the conference committee of managers of the western railways, E. P. Curtis, president of the Order of railway conductors and A. F. Whitney, president of the Brotherhood of Railroad Trainmen, was immediately presented to the general brotherhood chairman for each railroad, who were assembled at Chicago on August 30. The brotherhood committee failed to ratify the agreement signed by its leaders, turning down both the proposal of a 6½ per cent increase in wages with no changes in rules repecting double headers and length of trains, and the proposal for a wage increase of 7½ per cent with changes in rules.

When a break seemed imminent at that time, three members of the mediation board, Samuel E. Winslow (chairman) Edwin P. Morrow and G. W. W. Hangar, continued negotiations between the brotherhoods and the railways on September 13. On September 18, Chairman Winslow issued the following statement

Long Freight Train Movements, 1914 and 1928—Two Experimental, Two in Regular Service

Date	Date Reported in Railway Age	Road	Distance Miles	Cars	Weight of Cars	Length of Train	Locomotives	Tractive Effort	Ruling Grade
July 23, 1914	July 31, 1914	Erie	23	251	17,912 Tons	8,547 ft.	2-8-8-8-2	160,000 lb.	0.09 per cent
Nov. 15, 1914	July 23, 1921	N. Y., N. H. & H.	48	201	3,962 Tons	8,000 ft.	Three electric motors	.....	0.58 per cent
June 24, 1928	July 7, 1928	Virginian	123	189	4,500 Tons	7,848 ft.	2-10-10-2	147,000 lb.	0.60 per cent
July 16, 1928	July 21, 1928	Virginian	123	201	4,573 Tons	8,482 ft.	2-10-10-2	147,000 lb.	0.60 per cent

at Chicago: "In behalf of the board of mediation, the proceedings have been terminated for the reason that the carriers and the employees' organizations were unable to reach an agreement." In case President Coolidge should be advised by the mediation board of a need for the appointment of a fact-finding commission, the brotherhoods have indicated that a strike will not be called until the 60 days provided under the railway labor act have elapsed. The members of the brotherhoods have already placed the calling of a strike in the hands of their leaders. Mr. Whitney also indicated that the unions were disposed to wait for a few days for the action of President Coolidge before taking definite steps toward a strike. Mr. Higgins issued a statement for the railroads in which he said: "The public should understand that the failure to settle the controversy between the western railways and their conductors and trainmen has been entirely due to the rejection by the labor organizations of two different proposals of arbitration. One of these proposals was made by the conference committee of managers representing the railways. The other was drawn up by the United States Board of Mediation, created by Congress and representing the public; and it was accepted as a fair basis of settlement by the presidents of the Order of railway conductors and the Brotherhood of railroad trainmen, but was repudiated by the general committees of these organizations.

"The proposition made by the conference committee of managers was that the conductors and trainmen should be given a 6½ per cent advance in wages and should keep certain rules restricting the efficiency of operation; or, that they should be given a 7½ per cent increase in wages and the rules in controversy should be arbitrated. After this proposal had been rejected the plan of settlement drawn up by the United States Board of Mediation was that an advance of 7½ per cent should be given and that the question of the elimination or modification of the rules in controversy should be left to negotiation between the individual railways directly affected by the rules, and their own conductors and trainmen; and if this failed the matter to go to arbitration.

"This proposition was so manifestly fair, and even generous, that it was acceptable to the heads of the organizations and was also subscribed to by the railroads. Its rejection by the general committees shows an unwillingness on their part to accept any fair proposition involving arbitration. The Watson-Parker railway labor act, under which arbitration was proposed, was passed by Congress at the request of all the railway labor organizations and of a majority of the railways. The general committees of the conductors and trainmen of the western railways, by repeatedly rejecting arbitration under it have gravely imperilled the future usefulness of this law as a means of peacefully settling railway labor controversies."

The original agreement, signed by the brotherhoods and railroads in Washington, also provided that no strike would be called until a period of twenty-one days had elapsed after the rejection of the agreement by the committee of general chairmen. The agreement was refused by the general chairmen on September 9 making it mandatory that the unions refrain from calling a strike until after September 30.

Casualties to Employees Reduced Nearly One-Half

The records of the Safety Bureau of the New York Central Lines show that for the first half of 1928, the total number of employees killed was 43, which is a reduction of 46.25 per cent from the number shown for the first half of 1927, as appears in the table given herewith. The total casualties (killed and injured) 4,311, showed a reduction of 47.73 per cent. The number of employees in the service was, however, slightly less in 1928 than in 1927, so that the total casualties per million man hours, 12.01, figured 45.31 per cent less than in 1927.

The bulletin issued by the Bureau shows the casualties segregated to the five departments; transportation, motive power, rolling stock, M. W., and stores, and the totals are shown separately also for each road in the system. The statement includes simply the cases reported to the Interstate Commerce Commission; accidents fatal to the employees within 24 hours appear under the heading "Killed" and the figures for injuries include those cases in which the employee was kept from his work more than three days during the first ten days following the time of the accident.

N. Y. C. Employees' Accident Record

RANK	ROAD	CASUALTIES First Half 1927		1928		Casualties per 1,000,000 Man Hours			
		Killed	Injured	Killed	Injured	1927	1928	Increase Per Cent	Decrease Per Cent
1	Evansville, I. & T. H. Ry.	0	6	0	2	13.50	4.94		63.41
2	Chicago River & Indiana R.R.	1	21	0	12	8.62	4.95		42.58
3	Cincinnati Northern R.R.	0	24	0	5	25.16	5.77		77.07
4	Pittsburgh & Lake Erie R.R.	5	248	2	82	22.54	7.38		67.26
5	C. C. C. & St. L. Ry.	16	626	4	258	22.54	9.61		57.36
6	New York Central—O.C. Lines	2	196	0	64	25.35	10.43		58.86
7	New York Central—Line West	15	735	13	379	20.81	11.53		44.59
8	Michigan Central R.R.	6	420	3	289	17.77	11.86		33.26
9	New York Central—Line East	32	1830	20	1027	23.57	13.98		40.69
10	Peoria & Eastern Ry.	1	25	1	18	20.09	14.87		25.98
11	Lake Erie & Eastern R.R.	0	11	0	6	26.87	16.05		40.27
12	Indiana Harbor Belt R.R.	2	89	0	68	22.01	17.12		22.22
	Total	80	4231	43	2210	21.96	12.01		45.31

Foreign

New Bolivian Railway Projected

Construction work was recently commenced on the first 100-mile section of the Bolivian government's projected 350-mile railway line between Cochabamba and Santa Cruz. This first section, for which construction contracts have been awarded to Kennedy & Carey, New York, is expected to be completed within the next two years. The line is expected to cost approximately $35,000,000, and will form the first direct rail contact between the rest of Bolivia and the Santa Cruz district, which lies on the eastern slope of the Andes mountains. Petroleum deposits, salt, gold, tin and copper mines have been found in this district which, in addition, produces sugar cane, mahogany, cotton, coffee and rubber.

Disastrous Train Wreck in Czecho-Slovakia

Twenty persons were killed and a like number seriously injured when an express train collided with a standing freight near the Austrian-Czecho-Slovak frontier on September 10. The accident which was one of the worst in the history of Czecho-Slovakian railways was attributed to a false signal given the express. The latter carried coaches from Paris and Berlin, enroute to Vienna and Budapest via Lundenburg. The three leading coaches were demolished, the first and second being telescoped and the third being overturned by the impact. Several prominent Europeans as well as American tourists were on the train. Most of the latter were in the Paris-Budapest car which was at the rear of the train and escaped with but slight damage.

British Railway Dividends Exceed Expectations

Interim dividend declarations made by the British railway companies for the first half of 1928, although less than last year as was anticipated, were nevertheless better than had been expected, according to reports to the Department of Commerce.

On the Great Western ordinary stock, the interim dividend was declared at 1½ per cent, as compared with 2¾ per cent a year ago. The London Midland & Scottish distribution is 1½ per cent, against 2 per cent a year ago. The Southern paid 2½ per cent on its 5 per cent preferred ordinary stock, which is the same as a year ago.

It was generally expected that the London & North Eastern in view of its special difficulties would again postpone paying anything on its four per cent second preference stock, which is a trustee security, until the full year's results are known. This practice was started a year ago. An interim dividend was declared only on the four per cent first preference stock, as was the case last year. The Metropolitan Railway paid

1¼ per cent on its ordinary stock as compared with one per cent a year ago.

The announcements made by the railway companies stated that part of the heavy fall in freight receipts during the first six months of this year has been offset by economies in operation. For instance, the directors of the London, Midland & Scottish stated that, in spite of a decline of £2,100,000 in gross receipts, the decrease in net revenue for the half-year is not more than £1,100,000, owing to economies and to improved net results from ancillary business. The Great Western has attributed a considerable amount of its decrease in gross receipts to the fall in heavy mineral and iron and steel traffic as a result of the depression in those basic industries.

Training Courses on South African Railways

Plans of the South African Railways & Harbors Administration to establish training courses in transportation subjects were announced in a recent publication of the administration. The courses, which will comprise intensive instruction in all phases of transportation work, will be open to a limited number of junior officers, selected by competitive examination, and university graduates with suitable educational background.

Instruction will be given in operation, traffic administration, accounting and personnel adminstration. Three years will be required to complete the course. During the training period, reports will be submitted by the student to the heads of the departments to which he may be successively assigned. Annual examinations will be held as well as annual interviews by a board of senior officers, which may, at its discretion, release any student from the course whose continuance seems undesirable. If this latter occur in the case of a former employee, he may return to his previous station, whereas the service of one selected from outside the ranks will terminate with such release from the course, unless the board desires to place him somewhere in the regular ranks.

The salary of the student will be £235 or about $1150 during the first year of the course, £282 or approximately $1375 during the second year and £330 ($1600) during the third. At the end of the training period the students will be appointed to positions equivalent to those of first grade clerks and their subsequent advancement will depend on their demonstrated ability.

Employees, to be accepted, will have to have been in the service for at least three consecutive years and be not less than 21 nor more than 25 years of age on the entrance examination date. The same age limits will be placed on university graduates who will also be required to pass a physical examination, to be trained in two languages and to have pursued courses of study which are likely to be of direct practical value in the service of the administration.

The course is an innovation in South Africa and thus is announced as an experiment, likely to be withdrawn or modified should circumstances warrant.

Traffic

The Mississippi Warrior boat service has completed a warehouse at Birmingport, Ala., at a cost of $109,000. It has capacity for storing 2,000 tons of merchandise.

The new cold storage warehouse of the Pennsylvania at Oregon and Delaware Avenues, Philadelphia, was opened for business on September 15, making the company's produce terminal at that point one of the largest and most complete perishable traffic centers in the world. The new building has eight floors, providing two million cubic feet of cold storage space. It will be operated by the General Cold Storage Company of Philadelphia.

The Indiana Public Service Commission has ordered the Chicago, Indianapolis & Louisville to restore before September 15 two trains, formerly operated between Michigan City, Ind., and Lafayette. The company was directed to make a thorough study of its transportation problems on this branch with a view to improving its passenger, mail and express service and to report its findings to the Commission by October 15.

The Pennsylvania is putting in service six gas-electric rail motor cars to take the place of trains heretofore propelled by steam, on branch lines in the vicinity of Pittsburgh. The runs will be between Steubenville, Ohio, and Chester, W. Va.; between Torrance, Pa., and Indiana, Pa.; between Butler Junction and Butler, Pa.; between Steubenville and Bellaire, Ohio; between Akron and Hudson, Ohio; between Rochester and Olean, N. Y.

The Colorado & Southern has applied to the Denver Public Utilities Commission for permission to discontinue the operation of passenger trains on its Denver-Leadville narrow gage branch, averring it is losing $400,000 a year. The company plans to run a mixed train twice a week, except between Como and Leadville, where it plans to run three trains a week when the highways are in bad condition.

Railways operating between the Twin Cities and Duluth, Minn., put into effect on September 1, a schedule of reduced fares to compete with various forms of highway travel. Round trip fares now charged by the motor coaches will be met by three roads, the Great Northern, the Northern Pacific and the Minneapolis, St. Paul & Sault Ste. Marie. A tariff covering coach excursion fares, which will be effective until September 30, with a return limit of 15 days, was also announced.

The Public Utility Commission of New Jersey has granted the petition of the Pennsylvania for leave to discontinue the operation of passenger trains on the Rocky Hill branch, effective September 30. This branch, six miles long, from Monmouth Junction, N. J., to Rocky Hill, running two trains each way on week-days, has been operated at a loss for a long time. Motor coach service is to be provided from Rocky Hill and from Kingston, the two principal stations on the branch, to Princeton.

The Alabama, Tennessee & Northern has complained to the Alabama Public Service Commission against the refusal of the Alabama Great Southern to participate in establishing through routes and rates between points on the complaintant's new extension including Mobile, Ala., and Calvert and intermediate points on the defendant's line. The action is an effort to obtain part of the traffic originating in the Birmingham district for routing over the Alabama, Tennessee & Northern from New York to Mobile.

A "fruit packing train" is the most recent device for enabling a railroad to show in a practical way its interest in the business of the farmers adjacent to its lines. A train thus described, and managed jointly by the New York Central Lines and the Merchants' Despatch, is visiting various towns in Eastern New York. Lectures are given by Professor G. W. Peck of the College of Agriculture and by railroad representatives. Instruction is given not only in the proper loading of refrigerator cars but also in methods of protecting perishable products from freezing.

Pineapples from Cuba

The Southern ran 52 special trains from Jacksonville, Fla., to Cincinnati, Ohio, during the movement of this year's Cuban pineapple crop, each train composed of an average of 34 cars. The total movement was 2,289 cars. As in previous years, the pineapples were ferried from Havana to Key West and moved by the Florida East Coast from Key West to Jacksonville. The average time from Jacksonville to Cincinnati was 49 hours, 27 minutes, as compared with an average of 51 hours, 36 minutes for the 49 special trains run in 1927.

Southeast Shippers' Board

The Southeast Shippers' Advisory Board held its 23rd regular meeting at Biloxi, Miss., on September 7, with an attendance of approximately 350 shippers and railroad representatives. P. E. Odell, vice-president and general manager of the Gulf, Mobile & Northern, spoke on "Southern Service," describing the south's agricultural and industrial resources and development and the possibilities for future advancement along these lines. The co-operation of shippers in promoting transportation efficiency was outlined by L. O. Crosby, president of the C. & R. Lumber Company and of the Mississippi State Board of Development. B. E. Eaton, president of the Mississippi Power Company at Gulfport, Miss., also addressed the meeting.

Atlantic City Traffic

Passenger traffic between Philadelphia and Atlantic City over the Delaware

River bridge route of the Pennsylvania for the four days of heavy travel incident to Labor Day—Friday, Saturday, Sunday, Monday—increased this year over the movement of 1927, by about 37 per cent shoreward and 40 per cent on the return journey. This increase is in large measure due to the low fare, $1.75 for the round trip, which has been in effect on Sunday excursion trains since last Spring and on trains every day in the week during the summer.

Taking in also the travel between New York and Atlantic City; New York and Philadelphia, and between New York and the North Jersey resorts (on the line to Point Pleasant) the total number of passengers carried by the Pennsylvania on the four days referred to was 207,421, an increase of 18 per cent over 1927.

U. S. Freight Co. Plans Expansion

In accord with recently instituted plans for expansion of its activities, the United States Freight Company is negotiating for the acquisition of the L. C. L. Corporation which controls basic patents on the freight containers which are used in the operations of the Universal Carloading & Distributing Company, a subsidiary of the U. S. Freight Company.

Negotiations are also being carried on with the Missouri Pacific with a view to the establishment of container car service on that line under an arrangement similar to that now in effect with the New York Central, Lehigh Valley and Pennsylvania. During the first seven months of 1928, a total of 840,688 tons of freight were handled through the Universal Carloading & Distributing Company. This is an increase of 230,187 tons as compared with the business handled during the corresponding period of 1927.

Trans.-Missouri Shippers' Board

The commodity committee reports, presented at the meeting of the Trans-Missouri-Kansas Shippers' Advisory Board at Joplin, Mo., on Sept. 19, estimate that the carload requirements of 29 principal lines of industry, for the months of October, November and December, will be 514,832 cars, as compared with 472,024 cars loaded during the corresponding period of last year, an increase of 9 per cent. The increases are agricultural implements, 7.5 per cent; automobiles, 2.1 per cent; coal, 5.0 per cent; eggs, 1.9 per cent; fresh fruits, 10.1 per cent; fresh vegetables, 9.8 per cent; grain, 47.0 per cent; grain products, 15.0 per cent; hay, straw and alfalfa, 7.4 per cent; iron and steel, 1.4 per cent; lime, plaster and gypsum, 18.7 per cent; live stock, 0.7 per cent; petroleum and products, 5.0 per cent; and salt, 2.0 per cent. The decreases are clay products, 34.6 per cent; coke, 18.0 per cent; dairy products, 8.7 per cent; poultry, 7.4 per cent; castings and machinery, 1.4 per cent; number, 2.2 per cent; forest products, 2.7 per cent; ore, 14.9 per cent; packing house products, 1.4 per cent; and sand, stone and gravel, 1.6 per cent.

Equipment and Supplies

Locomotives

THE CANADIAN PACIFIC has completed work on two K-1 class locomotives, 4-8-4 type, in its Angus shops. One of these, No. 3100 has already been placed in operation. This locomotive has a weight of 424,000 lb. and a tractive effort of 60,800 lb. equal to 3685 hp. It is the largest passenger locomotive in the British Empire and has a boiler pressure of 275 lb.; the length of the engine and tender is 97 ft. 5 in.; the driving wheels have diameters of 75 in. and the cylinders are 25½ by 30 in. The tender has a coal capacity of 18½ tons and a water capacity of 12,000 gal. A photograph of this locomotive is shown in the *Railway Age* of September 8, page 456.

Freight Cars

THE HIGH POINT, THOMASVILLE & DENTON is inquiring for 50 box cars of 40 or 50 tons' capacity.

THE AMERICAN OIL COMPANY, Baltimore, Md., has ordered two three-compartment tank cars of 4700 gal. capacity, from the General American Tank Car Corporation.

THE PITTSBURG & SHAWMUT has ordered four caboose cars from the Pressed Steel Car Company. Inquiry for this equipment was reported in the *Railway Age* of June 9.

The Illinois Traction System has ordered 100 box cars from the Mount Vernon Car Manufacturing Company, and 100 composite gondola cars from the American Car & Foundry Co. Inquiry for this equipment was reported in the *Railway Age* of September 8.

Passenger Cars

THE DENVER & SALT LAKE is inquiring for one business car.

THE CHICAGO GREAT WESTERN has ordered a 300 hp. power plant from the Electro-Motive Company, to be used in converting one of its McKeen motor cars.

THE ST. LOUIS-SAN FRANCISCO has ordered two 220 hp. power plants from the Electro-Motive Company, to be installed in existing car bodies at its own shops.

THE TONOPAH & TIDEWATER has ordered one rail motor car, to be equipped with an Electro-Motive Company's 275 hp. power plant. The car body will be built by the St. Louis Car Company.

THE MARYLAND & PENNSYLVANIA has ordered one rail motor car, to be equipped with two Electric-Motive Company's power plants, totalling 440 hp. The car body will be built by the St. Louis Car Company.

Iron and Steel

THE PENNSYLVANIA is inquiring for 250 tons of steel for various bridges.

THE ERIE is inquiring for 150 tons of steel for a bridge at Youngstown, O.

THE SOUTHERN is inquiring for 200 tons of steel for four bridges.

THE CHESAPEAKE & OHIO has placed an order for 200 tons of steel for a bridge in West Virginia.

THE NEW YORK CENTRAL is inquiring for 1000 tons of steel for a bridge at Rensselaer, N. Y. This road has placed an order for 200 tons of steel for a bridge at Mott Haven, N. Y.

Machinery and Tools

THE NILES-BEMENT-POND COMPANY has received, from the railways, orders for a 2,500 lb. double frame steam hammer: a 36 in. to 44 in. side head boring mill; an Underwood 3½ in. by 6 ft. boring bar and a Racine No. 2 saw.

THE CHICAGO & NORTH WESTERN is inquiring for one 75-ton bushing press.

THE CHICAGO, BURLINGTON & QUINCY is inquiring for three 36 in. shapers.

THE MISSOURI PACIFIC is inquiring for a 44 in. side head motor driven vertical boring and turning mill, with 4-jaw independent chuck table.

THE CHICAGO & ILLINOIS MIDLAND has ordered 1 Bradley 500 lb. upright helve hammer, from Manning, Maxwell & Moore, Inc.

THE MISSOURI PACIFIC has ordered 1 Micro Machine Company's Model FG heavy duty railroad internal grinder with link grinding attachment, and 1 Micro Machine Company's portable locomotive crank pin grinder, from Manning, Maxwell & Moore, Inc.

THE CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC is inquiring for 18 machine tools, including:

1, 3½-in. turret lathe
1, 20-in. brass lathe
1, 3½-in. semi automatic turret lathe
1, 30-in. x 18-in. lathe
1, 42-in. lathe
2, 32-in. shapers
2, internal grinders
2, 20-in. drills
1, 3-ft. radial drill
1, planer
2, electric rivet heaters
1, screw machine
1, 72-in. boring mill
1, 4½-in. horizontal boring machine.

Signaling

THE BALTIMORE & OHIO has ordered from the Union Switch & Signal Company material for the installation of remote power switches at Rosemont, W. Va., and Bridgeport, W. Va.; three at Rosemont and four at Bridgeport. Table interlocking machines, eight levers and 12 levers, will be used. All switch movements will be equipped for dual control.

Supply Trade

W. G. Willcoxson has been appointed sales representative of the **MacLean-Fogg Lock Nut Company**, Chicago.

The Bates & Rogers Construction Company has opened an office at 75 West street, New York. **Roy E. Ross**, district manager, will be in charge.

Frank B. Parker, general manager of **Briggs & Turivas, Inc.**, Chicago, has been elected vice-president and general manager.

Lawrence A. Carpenter, for the past ten years railroad sales manager of the **Tousey Varnish Company**, Chicago, has been promoted to sales manager, in charge of all sales.

Edward S. Sullivan has been appointed special coast representative for the **St. Louis Car Company**, with headquarters in San Francisco, Cal., and will assist **Gus Koch**, coast agent, who is absent because of illness.

The **Winston Bros. Company** and the **Winston-Dear Company**, Minneapolis, Minn., have consolidated as the **Winston Bros. Company**, constructors and engineers.

The **United States Electrical Tool Company**, Cincinnati, Ohio, has opened a branch office at 1641 Stout street, Denver, Colo., in charge of **L. B. Putnam. J. R. Baumberger** has been appointed representative at Dallas, Tex.

John H. Rodger has resigned as vice-president of the **Safety Car Heating & Lighting Company**, as of October 1, to become associated with the **Union Carbide & Carbon Corporation;** Mr. Rodger retains his interest in the affairs of the Safety Company and will continue as a member of its board of directors.

The **Syntron Company**, Pittsburgh, Pa., has appointed the following district sales managers: **W. F. Delaney**, 203 Mutual building, Richmond, Va.; **A. C. Heath, Jr.**, 706 Globe building, St. Paul, Minn.; and **M. N. Thackaberry**, 308 East Third street, Los Angeles, Cal.

Under an arrangement which becomes effective immediately the **Ellcon Company**, New York City, will be general sales representative for Peacock staffless brakes in the United States, Canada and foreign countries. Announcement to this effect has been made by Frank D. Miller, president of the National Brake Company, Buffalo, N. Y., manufacturer of the Peacock brakes. The addition of this device extends the field of activity of the Ellcon Company which since its organization in 1910, has specialized in passenger car equipment devices. The Peacock brake is use on both passenger and freight equipment. William Wampler, president of the Ellcon Company, will devote particular attention to this phase of the company's activity.

The **Timken Roller Bearing Company**, Canton, Ohio, has incorporated the **Timken Steel and Tube Company**, which will take over the manufacture and sale of Timken steel and tubing. The headquarters and mills of the new company are in Canton, Ohio, and sales offices are located in Chicago, Los Angeles, Cal., Detroit, Mich., and New York. The officers of the new company are: chairman, **H. H. Timken**, president of the Timken Roller Bearing Company; president, **M. T. Lothrop**, vice-president of the Timken Roller Bearing Company; vice-president, **J. W. Spray**, general manager of sales of the Timken Roller Bearing Company; vice-president in charge of sales, **A. J. Sanford**, manager of steel sales of the Timken Roller Bearing Company; vice-president in charge of operation, **J. E. Daily**; and secretary and treasurer, **J. F. Strough**, secretary and treasurer of the Timken Roller Bearing Company.

Obituary

Walter C. Arthurs, president of the Mount Vernon Car Manufacturing Company, died suddenly while returning wth his family from Minnesota. Mr. Arthurs was born in 1865, at Hillsboro, Ill.

Trade Publication

WHITCOMB LOCOMOTIVES.—Bulletin 2822 of Geo. D. Whitcomb Company, Rochelle, Ill., describes 2½-ton, 3½-ton, 4½-ton and 5-ton gasoline locomotives, designed with a short wheel base and a low center of gravity, for operating over narrow gage, industrial tracks.

SLEEPING CARS OF A NEW DESIGN and available to passengers with second-class railroad tickets are now being operated on certain trains over the main line of the Paris Lyons & Mediterranean in France, between Paris, Marseilles and Vintimille on the Italian frontier, according to reports to the Department of Commerce.

Heretofore the sleeping car service, provided by the International Sleeping Car Company, has been available only to holders of first class tickets. The total cost of sleeping car accommodation for the 12-hour run from Paris to Marseilles has amounted to 690 francs (about $27.50); from Paris to Nice, 865 francs (about $34.50). The new second class sleeping car service, inaugurated on August 1, provides corresponding accommodations at considerably reduced prices, the inclusive cost for railroad fare and berth between Paris and Marseilles being 487 francs (about $19.50), and between Paris and Nice, 603 francs ($24.).

The new cars, which have been built especially for this service, include 12 compartments of two berths each.

Construction

BALTIMORE & OHIO—This road has awarded a contract to the Vang Construction Company, Cumberland, Md., for the construction of piers and abutments for two bridges at Tippecanoe, Ohio. Approximately $40,000 is involved in the contract.

BESSEMER & LAKE ERIE.—This road plans to construct additional water supply facilities at Branchtown, Pa. The work is expected to cost approximately $32,700.

BOSTON & ALBANY.—This road has awarded a contract to the J. F. Fitzgerald Construction Company, Boston, Mass., for the installation of four circular wet-type ash pits at its Beacon Park yard in Boston, Mass.

CANADIAN NATIONAL.—This road has awarded a contract to the Foundation Jupiter Company, Ltd., Halifax, N. S., for the construction of its new station and adjoining hotel at Halifax. The new hotel which will have 168 rooms with provision for expansion to an additional 150 will be called as the "Nova Scotia." The station building will be 160 ft. by 100 ft. and of the same style and design as the hotel. Access from the station to the hotel will be from the station concourse through an arcade.

DELAWARE & HUDSON—Plans for the elimination of a grade crossing on its line at Wellsboro, N. Y. are being prepared by this road for submission to the New York Public Service Commission.

HOUSTON NORTH SHORE.—This company has applied to the Interstate Commerce Commission for authority to construct a 9-mile extension from its main line near Green's Bayou, Tex., in the form of a loop to a connection with the main line at a point near the west side of the San Jacinto river.

LONG ISLAND.—The Public Service Commission of New York has ordered the elimination of four grade crossings on this road at Valley Stream, N. Y. The work will be done at Franklin and Rockaway avenues and Rockaway road on the Montauk division and at Scranton avenue on the West Hempstead branch.

NEW YORK CENTRAL.—The city council of Toledo, Ohio, has adopted an ordinance providing for the issuance of $500,000 of bonds for the construction of a grade separation structure at Central avenue and the tracks of this company and the Michigan Central at Toledo.

NEW YORK CENTRAL.—This company has awarded a contract to Heyl & Patterson for the installation of an additional all-electric car dumper on the docks of the Ohio Central Lines at Toledo, Ohio. The equipment is to be furnished by the General Electric Company.

PENNSYLVANIA.—This road recently awarded a contract to the Erection Corporation, Pittsburgh, Pa., for steel work in connection with the construction of the auction house at its new produce terminal at Pittsburgh, Pa. A second contract, involving about $45,000 for track laying and line changes from Glen Osborne, Pa., to Shields, Pa., went to the Newhall Company, Cleveland, Ohio. Two grade crossing elimination contracts, one for work, involving about $23,000 at Penns Neck, N. J., and the other, for work involving approximately $26,000 at Bordentown, Pa., went, respectively, to James F. Brogan & Company, and to Young Bros., Inc., both of Philadelphia, Pa.

PENNSYLVANIA-LEHIGH VALLEY.—These roads have jointly awarded two contracts, involving approximately $500,000, for furnishing and erecting a portion of the steel work on the new bridge over Newark Bay, at Greenville, N. J. These two awards each involved $250,000 and went one to the Bethlehem Steel Company, Bethlehem, Pa., and the other to the American Bridge Company, Philadelphia, Pa.

RUTLAND.—This road plans the construction of a new heating plant at Malone, N. Y. Bids have been received on work in connection with the erection of the boiler and chimney, while those for piping and building alterations have not yet been invited. The project is expected to cost approximately $35,000.

TOLEDO, PEORIA & WESTERN—A contract has been let to the Austin Company, Cleveland, Ohio, for the construction of buildings for mechanical facilities at East Peoria, Ill. Company forces will be employed in the construction of a new yard at this point.

WACO, BEAUMONT, TRINITY & SABINE.—This company plans the construction of a round house at Beaumont, Texas in connection with the extension of its line from Beaumont to Waco and Port Arthur.

Railway Finance

MISSOURI AND NORTH ARKANSAS.—*Asks to be included in merger.*—Federal Judge Martineau of Little Rock, Ark., on September 17 authorized W. Stephenson of Harrison, Arkansas, receiver of the Missouri and North Arkansas, to intervene before the Interstate Commerce Commission and request that that railroad be included in the proposed merger of the Missouri-Kansas-Texas, the St. Louis Southwestern and the Kansas City Southern.

NEW YORK, CHICAGO & ST. LOUIS.—*Notes.*—This company has applied to the Interstate Commerce Commission for authority to issue 6 per cent promissory notes to the amount of $5,000,000, the proceeds to be used to provide additional working capital and to meet cash requirements during the next few months.

PANHANDLE & SANTA FE.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to execute to the Guaranty Trust Company of New York a general mortgage on all its property and to issue thereunder one 6 per cent bond for $9,000,000 dated July 1, 1928 and maturing July 1, 1953, to be delivered to the Atchison, Topeka & Santa Fe at par in satisfaction of an equal amount of indebtedness.

WESTERN RAILWAY OF ALABAMA.—*Bonds.*—The Interstate Commerce Commission has modified a previous order which authorized this company to issue $1,543,000 of bonds to permit their deposit pending sale as collateral security for short-time loans.

WESTERN PACIFIC.—*Stock and Bonds.*—The railroad company has requested authority from the Interstate Commerce Commission to issue 8,000 shares of preferred stock at $100 par a share and $572,800 of first mortgage 5 per cent bonds. The carrier proposes to sell the stock at par to the Western Pacific Railroad Corporation and to sell the bonds in a single block on competitive bidding. The proceeds will be used to finance the purchase by the Sacramento Northern of the property of the San Francisco-Sacramento Railroad. The Sacramento Northern has applied to the Commission for authority to issue and deliver to the Western Pacific 5¾ per cent promissory notes for $1,372,800 payable March 1, 1943.

WICHITA FALLS & SOUTHERN.—*Bonds.*—This company has filed a supplemental application to the Interstate Commerce Commission for authority to issue $3,500,000 of first mortgage and collateral lien 5 per cent gold bonds, to be secured by lien on all its properties. It also asks authority to cancel $161,000 of common stock heretofore authorized to be issued, and $668,000 of preferred stock, as well as $176,700 of the $1,176,700 of common stock heretofore authorized and to issue in lieu thereof $1,000,000 of the stock authorized by the commission.

GEORGE COLE SCOTT, a director of the Chesapeake & Ohio, made the following statement on September 19:

I am at a loss to understand the opposition to the Chesapeake & Ohio Railway's acquisition of stock control of the Pere Marquette which is being continued by a stockholders' committee headed by George S. Kemp of Richmond. I know of no mandate he holds from other stockholders to uphold his contention, and I cannot do else than assume he represents no one but himself and the small holdings of his committee with the possible exception of a few personal associates.

Last spring, after the Interstate Commerce Commission had decided that it would be in the public interest, from a transportation viewpoint, for the Chesapeake & Ohio to acquire stock control of the Pere Marquette, Mr. Kemp approached President Harahan, stated that he and his committee were eager to see the Pere Marquette acquired and that they were prepared to cooperate to bring about that result. It developed, however, that cooperation on his part meant that two members of his committee should be taken onto the board of directors of the Chesapeake & Ohio, and as that was refused he is now in active opposition to the plan, both as an intervenor before the commission and in an open letter to Mr. Harahan in which he purports to tell the directors how much better the road's money could be spent. In other words, he arrogates to himself as a stockholder the function of the board of directors as to the policy of the Chesapeake & Ohio.

In the first Nickel Plate unification case, in which I was chairman of a minority committee representing over 150,000 shares of C. & O. stock, I opposed the terms on which it was then proposed that the C. & O. should take over the Pere Marquette. But with the approval of that committee I testified before the I. C. C. that the Pere Marquette was a logical extension of the C. & O. and that it was a desirable acquisition, in spite of the fact that I did not agree with the terms then proposed.

The C. & O. had an option at $110 a share on a large block of Pere Marquette stock owned by the Nickel Plate road. Unfortunately this option expired before the I. C. C. gave its approval to the purchase and it was necessary to conduct negotiations anew. The proposed price of $133 a share was fixed by a committee of C. & O. directors of which I was a member, after lengthy conferences with the Nickel Plate directors. As there is a large minority interest in Nickel Plate, quite outside of the Van Sweringen holdings, Nickel Plate directors were obligated to properly protect that interest in proportion to the enhanced value of Pere Marquette.

It was felt that $133 was an open market fair value. The Van Sweringen interests are willing to let the C. & O. have their Pere Marquette stock at what it cost them, which is $69, and that makes the average price of the two lots $122. When one considers that the old price of $110 was arrived at two years ago, and that since then Pere Marquette has added $12 a share to its surplus, it is obvious that in reality C. & O. is buying the stock at the original option price. In view of the general advance in all securities, this price is comparatively much below $110.

In giving its approval to C. & O. acquisition of stock control of the Pere Marquette, the I. C. C. practically gave its approval to the first eastern trunk line consolidation. Although in its decision the commission declined to approve stock acquisition of the Erie by C. & O., it said that C. & O. has not paid more than a fair value for the Erie stock it already has acquired but made no comment as to the ultimate disposition of that stock. One can only assume that the commission is waiting for the final allocation of the eastern trunk lines before committing itself as to the ultimate disposition of the Erie which may yet find itself allied with C. & O. There never has been any question as to the value to C. & O. of the Erie line from Marion, O., to Chicago, which would provide a low grade line for coal from the C. & O. mines and avoid the congested Cincinnati gateway.

In any case, Erie is a great property now coming into its own under new management after years of financial starvation. The large holdings of its stock by C. & O. should prove of great value to C. & O. stockholders in the future.

Dividends Declared

Boston & Maine.—Prior preferred, 1¾ per cent, quarterly; first preferred class A, 1¼ per cent, quarterly; first preferred class B, 2 per cent, quarterly; first preferred class C, 1¾ per cent, quarterly; first preferred class D, 2½ per cent, quarterly; first preferred class E, 1⅛ per cent; all payable October 1 to holders of record September 14.

Cleveland, Cincinnati, Chicago & St. Louis.—Common, $2.00, quarterly; preferred, $1.75, quarterly; both payable October 20 to holders of record September 28.

Joliet & Chicago.—1¾ per cent, quarterly; payable October 1 to holders of record September 21.

Mahoning Coal Railroad.—Common, $12.50, quarterly, payable November 1 to holders of record October 15.

New York Central.—2 per cent, quarterly, payable November 1 to holders of record September 28.

Philadelphia & Western.—Preferred, $.62½, quarterly, payable October 15 to holders September 29.

Southern.—Common, $2.00, quarterly, payable November 1 to holders of record October 1; preferred, $1.25, quarterly, payable October 15 to holders of record September 24.

Wabash.—Preferred A, $1.25, quarterly, payable November 24 to holders of record October 25.

West Jersey & Seashore.—2½ per cent, semi-annually, payable October 15 to holders of record October 1.

Average Price of Stocks and of Bonds

	Sept. 18	Last week	Last year
Average price of 20 representative railway stocks.	123.05	122.75	120.76
Average price of 20 representative railway bonds..	93.58	93.42	95.31

Officers

Executive

W. R. Stevens, secretary and assistant to the president of the Minneapolis, Northfield & Southern, has been elected vice-president, with headquarters as before at Minneapolis, Minn.

Simon F. Tolmie, following his election as premier of British Columbia and appointment as minister of railways of that province, has become president of the Pacific Great Eastern, with headquarters at Victoria, B. C. He succeeds **W. H. Sutherland,** who was minister of railways of British Columbia and president of the Pacific Great Eastern.

Financial, Legal and Accounting

John D. Osborn has been elected secretary of the Minneapolis, Northfield & Southern, with headquarters at Minneapolis, Minn.

Cope J. Hanley, who has been appointed general attorney of the Chicago, Indianapolis & Louisville, with headquarters at Chicago, was born at Rensselaer, Ind., on June 22, 1894. He attended the University of Colorado and was graduated from the law school of Vanderbilt University in 1917. Mr.

Cope J. Hanley

Hanley was admitted to the bar in Indiana in the same year. From August, 1917, to December, 1918, he served with the United States Army and then became a member of the law firm of Hanley & Hanley at Rensselaer. For a number of years previous to his appointment as general attorney of the Monon, Mr. Hanley's law firm had been local attorneys for that railroad at Rensselaer.

Operating

E. C. Gegenheimer, assistant trainmaster on the Toledo division of the Pennsylvania, has been promoted to trainmaster on special duty in the Eastern region. **L. R. Winslow,** fireman instructor on the Grand Rapids division, has been appointed acting assistant trainmaster of that division at Cadillac, Mich., succeeding **John S. Campbell,** deceased. **C. L. Sheets,** general yardmaster on the Grand Rapids division, has been promoted to assistant trainmaster on the Eastern division at Island avenue, Pittsburgh, Pa.

Traffic

Louis G. Hoff, who has been promoted to traffic manager of the Southern Pacific of Mexico, with headquarters at Guadalajara, Jal., has been in the service of the Southern Pacific Lines for 17 years. He was born at Tucson, Ariz., on November 9, 1892, and attended high school in that city in 1911. Later he took a university extension course in traffic. Mr. Hoff entered railway service in September, 1911, as a messenger in the local freight office of the Southern Pacific at Tucson and in the same year he was transferred to the traffic department at Tucson where he served successively for the next seven years as a messenger, as a file clerk, as a tracer clerk, as a tariff clerk, as a claim investigator and as a rate clerk. From April, 1918, to March 1919, he served in the United States Naval Aviation Corps of the American Expeditionary Force, then returning to the Southern Pacific traffic department as a rate clerk. During 1920 Mr. Hoff was promoted to chief rate clerk and in October of that year he was appointed assistant to the general freight and passenger agent of the Southern Pacific of Mexico at Guaymas, Son. In August, 1921, he was promoted to assistant general freight and passenger agent of the S. P. of Mexico, with headquarters at Guaymas, being further promoted to general freight and passenger agent in August, 1923. Mr. Hoff was promoted to traffic manager on August 1.

Engineering, Maintenance of Way and Signaling

H. A. Lathrop, assistant engineer on the Los Angeles division of the Southern Pacific, has been promoted to assistant division engineer of the Coast division, with headquarters at San Francisco, Cal.

A. R. Fugina, signal engineer of the Louisville & Nashville, with headquarters at Louisville, Ky., retired from the active service of that company effective July 1 after more than 17 years as signal engineer. He was born on July 27, 1876, at Fountain City, Wis., and graduated from the University of Wisconsin with the degree of civil engineer in 1898. In the following year he entered railway service as a tapeman on construction on the Chicago & North Western and in 1903 he was advanced to assistant engineer. Mr. Fugina was promoted to assistant signal engineer of the North Western in 1907 and in December, 1910, he was appointed signal engineer of the Louisville & Nashville.

Mechanical

Hugh H. Boyd, assistant chief mechanical engineer on the Canadian Pacific, with headquarters at Montreal, Que., has been appointed assistant chief of motive power, with the same headquarters. **William A. Newman,** mechanical engineer, with headquarters at Montreal, has been appointed chief mechanical engineer, with headquarters at the same point.

Special

Carl R. Gray, Jr., has been appointed manager of the industrial department of the Chicago & North Western and the Chicago, St. Paul, Minneapolis & Omaha, with headquarters at Chicago and St. Paul, Minn., newly created positions.

Obituary

Arthur C. Irons, formerly general passenger agent of the Chicago Great Western and more recently engaged in the brokerage business, died at Detroit, Mich., on September 16, following an extended illness.

William C. Artigan, superintendent of the northern division of the New York, Ontario & Western, died at his home in Norwich, N. Y., on September 19, after a five-year illness. Mr. Artigan was 74 years of age and had served as superintendent for 34 years.

William J. Bryson, who retired as assistant to the president of the Chicago & Alton in 1900, died at Lake Placid, N. Y., on September 16, at the age of 83 years. Prior to his appointment as assistant to the president Mr. Bryson had been assistant engineer on the Chicago & Alton.

Paul C. Benedict, assistant general passenger agent of the Baltimore & Ohio, with headquarters at Chicago, died on September 18, at the Henrotin hospital in that city, after a three months' illness. Mr. Benedict was 56 years of age and had been secretary and treasurer of the American Association of Traveling Passenger Agents since 1920.

John Opheim, general storekeeper of the Great Northern at St. Paul, Minn., from 1910 to 1916, died at his home in Tacoma, Wash., on August 6. He entered the service of the Great Northern in 1880 in the mechanical department at Fergus Falls, Minn. Later, because of an injury, he was transferred to the store department and in 1908 was advanced to storekeeper at Hillyard, Wash. In 1910 Mr. Opheim was promoted to general storekeeper and from 1916 to 1925, when he retired from active service, he was successively division storekeeper at Hillyard and at Marcus, Wash.

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Motor Transport Section
Devoted to the Co-ordination of Railway and Highway Service
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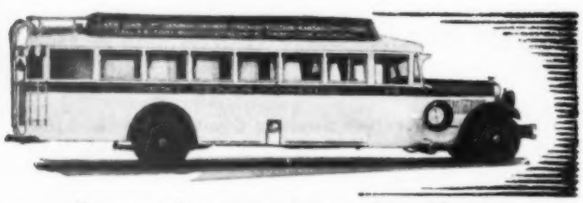

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Railway Age
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Delay Will Aggravate the Problem

WHAT is the "railroad problem?" If we see aright it is: How are the railroads going to secure, at the present time and for the future, earnings sufficient to pay a just return to their owners, to expand and improve their facilities for their patrons and to offer an opportunity for a promising and prosperous future for the men engaged in railroad work?

If railroad passenger traffic had not suffered enormous decreases and if freight traffic had not quit increasing at its pre-war rate, then the "railroad problem" today might not be as serious as it is. But that it is serious no informed person can deny.

The solution to this problem, if it is to be solved, will have to be worked out along several different lines. The efficiency of the handling of existing business must be continually increased. Fairer treatment from regulatory authorities and the public generally in the matter of rates and service requirements must be secured. Finally, effective measures must be taken to retain business for the rails which economically belongs upon them; complacency in the face of the filching of business by uneconomic competition must end, and steps must be taken to assure to the railroads a fair share of the increased traffic of the country.

Just as the "railroad problem," as above outlined, must be solved by effort along not one but several lines, just so the solution is placed in the hands of not one restricted group of railroad men, but of virtually all of them. Probably the most serious aspect of the problem, however, is the failure of traffic to increase at the normal rate or actually, as in the case of passenger business, to suffer heavy losses. This phase of the problem is closely connected with the railroads' relations with the motor transport field, both as a competitor and as an ally. The railroads have entrusted this part of their problem to their motor transport officers—men who make up the membership of the Motor Transport Division of the American Railway Association.

Motor Transport Officers' Responsibility

It is not too much to say, therefore, that what is probably the most aggravated phase of the present problem of railroad policy is now laid definitely at the door of the Motor Transport Division and the men who make up its membership. Should interstate motor transport be regulated, and, if so, to what extent? It is up to the motor transport officers of the railways to formulate a specific policy and see to it that the full weight of railroad influence is placed behind this policy in the endeavor to secure its enactment into law.

Should railroads engage in motor transport or not? If so, where and how? It is true that "conditions differ" on different roads, but is this difference in conditions as great as some seem to believe? Where, of two railroads operating under virtually the same conditions, one railroad utilizes motor transport in its business and the other does not, is it not safe to say that one is pursuing the proper policy and the other a mistaken policy? Railroad officers who are charged with the solution of problems of this kind need to study such situations with an open mind and, having once arrived at a reasonable conclusion, should be able to convince their superior officers of the soundness of their findings.

How Can Railroads Use Motor Vehicles?

Is there possibility of greater co-ordination of rail and highway transportation by the use of unit containers? Could not railroad-operated trucking organizations, using containers for local collection and delivery and rails for line haul, compete successfully with motor truck lines for business up to a hundred miles or so—and, what is just as important, could they not handle such business at a profit to the railroads? If this question could, after careful study, be answered in the affirmative, then a solution to two important phases of the "railroad problem" would appear—the securing of added traffic for the railroads and an increase in the efficiency of its movement. Who but the officers whom the railroads have assigned to study motor transport can find the answer to these questions and secure adoption by the railroads of the solutions they recommend?

The railroad man in whom his company has reposed the confidence of its designation as the officer who shall study and define for it a policy which will place the railroad in accord with the changing conditions of transportation has a two-fold task. In the first place, he should learn all he can about highway motor transport, and from this knowledge should formulate a wise policy for his company to pursue. Secondly, he should make his effort effective by an energetic presentation of his findings, calculated to secure the adoption by his company of the policy he recommends.

The foregoing brief discussion does not exhaust the possibilities of the work the railroads have entrusted to their motor transport officers, nor does it enumerate all the duties that go with this assignment. A complete analysis of the task would require a fair-sized volume. We believe, however, that we have adduced sufficient testimony to support our view that probably no other one group of railroad officers has in its hands a more important problem from the standpoint of the welfare of the railroads—or a problem which cries louder for immediate solution.

The executive officers of the railroads have looked

with favor upon the work of members of their staffs who are studying motor transport problems and have placed a potentially effective tool in their hands by authorizing the formation of the Motor Transport Division. The job is thus squarely up to the members of the Motor Transport Division. The responsibiilty is heavy, but with responsibility goes opportunity. This motor transport problem is one the solution of which, from the railroad standpoint, will be found simpler now than a month hence; simpler a month hence than a year from now; easier a year from now than several years hence; and, postponed too long, insoluble. Action, immediate and vigorous, is the only course wherein lies promise of victory.

Winter Weather is at Hand

THE news that the Northland Transportation Company is installing additional heaters in most of its motor coaches is a reminder, although one is not needed, that winter weather will soon be upon us. All the problems of motor coach and motor truck operations are multiplied during the winter months. Low temperatures and hazardous road conditions present obstacles to efficient operation which are not to be overcome easily. The motor coaches and motor trucks operated by the railways are expected to provide the dependable and comfortable transportation service of the trains which many of them have replaced. This is not easy in the winter. If this is to be done this winter, preparations for the more difficult operating conditions should be made at once, and will involve all the departments of the operating company. In past years notable records of performance have been made by the highway equipment of the railways. Similar performance records are expected this year, and they can be accomplished if adequate preparations are made in advance.

Interstate Regulation Still a Prospect Only

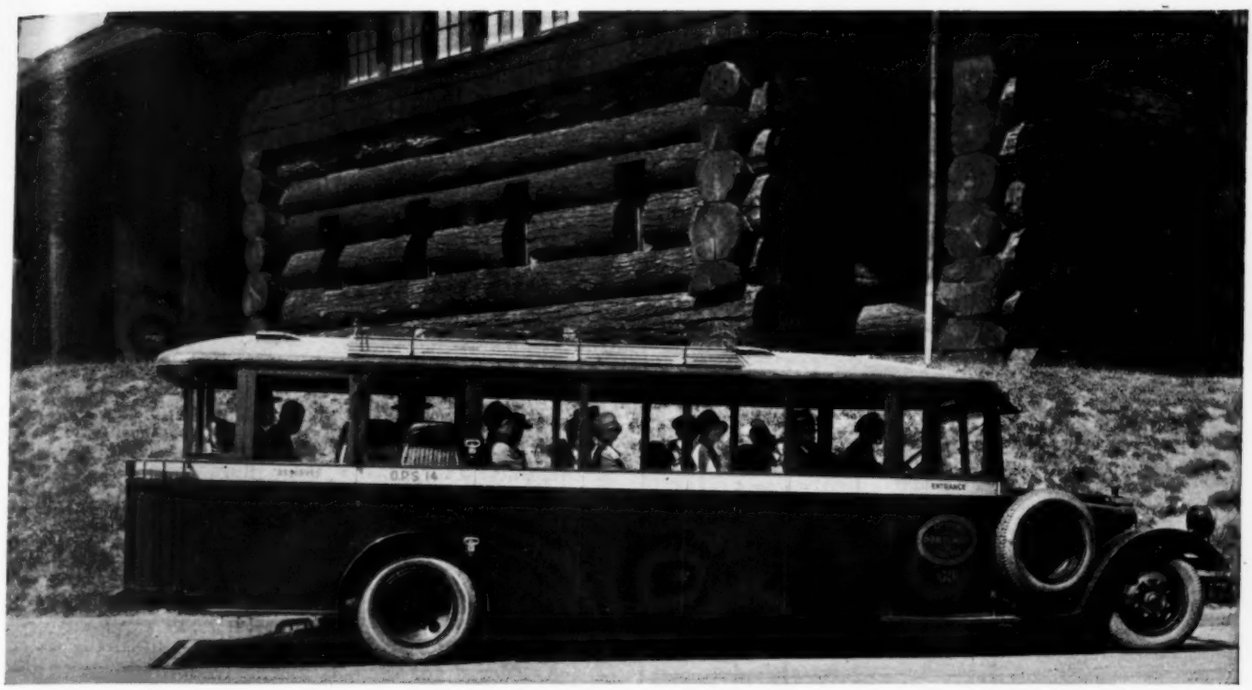
IN spite of the fact that virtually all parties in interest are in favor of regulation of interstate motor coach lines and desire the enactment by Congress of legislation providing for such regulation, there are still no definite indications that such legislation will be passed for some time to come. During the last session of Congress, it appeared almost certain that some action would be taken to place the interstate motor coach lines under regulatory authority. Due in part to the crowded congressional docket and in part to disagreement as to the practicability of the regulation to be provided under the proposed law, the bill failed to reach a vote. Presumably it will come up again for action when Congress convenes this winter, but a short session in a presidential year is not considered the most favorable time and occasion for the passage of legislation of this sort. Consequently there is slight chance for federal regulation of interstate motor coach operations for many months to come. One thing can and should be done in the meantime, however. All those who have declared themselves in favor of such regulation should prepare to present a united front when the matter is next considered by Congress, ironing out the disagreements which handicapped the bill introduced during the last session of Congress. In this way, perhaps, the delay in the enactment of regulatory legislation can be reduced to a minimum.

Detroit, Mich., October 24-26

DETROIT, Mich., will be an important city and October 24, 25 and 26 will be important days to many railway officers. These represent the place and dates of the next meeting of the Motor Transport Division of the American Railway Association. This meeting is certain to be well worth attending. The committees in the division have been assigned subjects which represent problems vital to the railways, and have had ample time to make headway on their reports. On account of Detroit's central location, the attendance at the meeting is expected to be large. All the officers of all the railways who are in charge of motor transport operations, or who are concerned with problems arising from their development, certainly ought to be there. Detroit, Mich., is the place; October 24-26, the dates.

Recovering L.C.L. Traffic by Motor Truck Operation

THE efforts of the Boston & Maine to recoup its losses of l.c.l freight by the inauguration of extensive motor truck service for this class of traffic should be of interest to other roads which are faced with similar problems in meeting highway competition. During the past year, this road, through its highway subsidiary, the Boston & Maine Transportation Company, has instituted a comprehensive l.c.l. freight trucking plan throughout the eastern section of the territory which it serves. Details of the system are described in an article published elsewhere in this issue. The plan involves the establishment of concentration points at important or centrally-located stations, where merchandise cars are received and forwarded. The l.c.l. freight is trucked between these concentration points and a number of smaller stations in the surrounding territory. Beginning in the summer of 1927, with the establishment of Boston, Mass., as a concentration point, these trucking activities have been expanded until at the present time, 145 stations are involved in operations centered about ten concentration points. The plan has resulted in savings of from 24 to 72 hours on freight in transit and has eliminated practically all collection and peddling of l.c.l. freight by local freight trains within the concentration areas. As to recovery of traffic, it is interesting to note that in the Boston area, where the plan has been in operation long enough to permit comparison, a selected number of stations which enjoyed the service from the outset forwarded by truck during the first six months of 1928, a total of 14,337 tons of l.c.l. freight, as against 7,900 tons forwarded by rail from the same stations during the first six months of 1927. While it is pointed out that some of this freight formerly may have been trucked into Boston freight houses of the Boston & Maine by suburban shippers who now deliver at their local houses, it is nevertheless felt that much of the increase is new business or recovered traffic which the expedited service has attracted. It would seem, therefore, that this l.c.l. freight trucking plan, which the Boston & Maine has deemed suitable for rapid expansion and wide extension, warrants careful study by traffic officers of other roads which are similarly faced with continued losses of traffic to highway freight carriers.



A New Type S. P. & S. Motor Coach With Observation Type Body Built in the Railway Shops

Overflow Business Handled Smoothly by S. P. & S.

Dispatching system solves difficult operating problem— Other operating methods described

THE outstanding operating problem met by the Spokane, Portland & Seattle Transportation Company, subsidiary of the Spokane, Portland & Seattle Railway, results from the extremely wide fluctuations in the volume of traffic handled from day to day. The principal motor coach route operated by the S. P. & S. extends from Portland, Ore., to Astoria, a distance of 105 miles and 14 round trip schedules are operated daily over all or part of this route. In addition, another route extends beyond Astoria to Seaside, 20 miles, over which four round trips are operated daily on winter schedules and 12 round trips daily on summer schedules. It also has a line connecting with the main line at St. Helens and extending to Vernonia, a distance of 28 miles, over which three round trips are operated daily. Recently an additional route was installed between Vernonia and Keezie, on which two round trips are made daily.

The passenger traffic on this line, while ordinarily heavy, is usually handled without difficulty on account of the frequent schedules which the motor coaches make. Not infrequently, however, there is a sudden temporary demand for extra accommodations, resulting in heavy overflow business. These overloads usually arise on weekends and are occasioned as a rule by heavy movements to and from the logging camps situated along the line of the transportation company. In summer, however, the problem of handling the heavy movements to and from the logging camps is complicated by similarly large movements of passengers to and from the beaches along the Pacific coast, served by the S. P. & S. Since it is a rule of the S. P. & S. Transportation Company that all passengers must have seats, the problem of providing adequate equipment to handle these overload movements assumes major proportions.

Distribution of Equipment

The S. P. & S. handles all its motor coach traffic, both ordinary and overflow, with only 35 units of equipment. It operates 33 White motor coaches, which were originally of the sedan type but which are rapidly being converted into parlor-type equipment, and 2 Cadillac cars. The parlor-type bodies, which it is installing on the old sedan-type equipment, are being built, incidentally, in the S. P. & S. shop at Portland.

The first step toward the solution of the overflow problem was the distribution of the equipment. Most of the motor coaches are housed at the Portland headquarters, but a substantial number of them are regularly located at various points along the lines. For example, from 5 to 10 motor coaches are kept at Astoria at all times, the company having its own garage at that point. At St. Helens from 3 to 5 motor coaches are located, these likewise being kept in the company's garage. Four coaches are kept at Vernonia at all times, these occupying rented space in a public garage, and one motor

coach is located at Rainier where storage space is also rented.

The number of drivers regularly employed by the transportation company is 19 and these are able to make all of the regular schedules shown on the timecard. On account of the occasional extra heavy business, however, it is necessary to maintain an "extra board" and 10 drivers are on this list. These are subject to call at any time when their services are required.

Spokane, Portland and Seattle Transportation Company

CASH FARES COLLECTED

STATIONS		NUMBERS			FARE		
FROM	TO	SINGLE TRIP	ROUND TRIP	HALF FARE	AMOUNT		
	TOTAL						

TICKETS COLLECTED
(NOT TO BE USED BY OPERATOR)

	TOTAL			

OPERATORS MUST ISSUE A CASH FARE CHECK FOR EACH FARE TENDERED AT TIME OF COLLECTION. GIVE PASSENGER RECEIPT TO PASSENGER AND ENCLOSE AUDIT STUB WITH THIS REPORT.

OPERATORS ARE REQUIRED TO ENTER ALL CASH FARES COLLECTED ON THIS FORM. USE A SEPARATE LINE FOR EACH CASH FARE CHECK ISSUED. ENTER THE NAME OF STATIONS FROM AND TO WHICH THE PASSENGER WAS CARRIED. LIST CHECKS IN CONSECUTIVE ORDER, COMMENCING WITH THE LOWEST NUMBER

ALL TICKETS COLLECTED SHOULD BE ENCLOSED WITH REPORT

Ticket and Cash Fare Collection Report

Dispatching System

Since it operates so many extra motor coaches, it is not possible to operate the equipment entirely on the basis of the timetable. Consequently, it is necessary to dispatch the motor coaches in the same manner that extra trains are dispatched. Under the supervision of the superintendent, A. E. Wager, whose headquarters are at Portland, are two dispatchers, one located at Portland and the other at Vernonia. It is the principal duty of these dispatchers to see that there is equipment available at all times and at every point, sufficient to provide a seat for every passenger who demands transportation. This involves the frequent concentration of equipment at points from which an exceptionally large number of passengers are to be carried. The extra coaches and drivers are dispatched entirely by telephone, and the dispatchers do not maintain what might be termed a train sheet but keep the operating situation at all times in their heads.

The dispatchers are assisted in anticipating the need for extra equipment by the station agents employed by the transportation company at the various stations on its lines. These agents notify the nearest dispatcher when an extraordinarily large number of people are waiting or are expected to be waiting at a station, and the dispatcher immediately orders extra equipment to the point of emergency from the nearest point where extra equipment is stored. Occasionally, if there are a few more people waiting at a station than the regular coach can provide for, the extra people are crowded into the regular coach and taken ahead until the extra coach ordered for them is met at some point down the road. It has been found that passengers prefer temporary standing in a coach to delay at a station while waiting for extra equipment.

At various times the S. P. & S. Transportation Company has had as many as six extra motor coaches in addition to the regular coach, on one schedule. In such cases the driver of the head car is in charge of the fleet. As passengers leave the coaches at various points along the line, the head driver transfers the remaining passengers into as few coaches as possible, releasing the others. The drivers of the cars thus released then telephone to the dispatcher under whose supervision they work, for instructions.

This dispatching system has been found very successful in meeting the problem of overflow business. The dispatchers do not ordinarily exercise much supervision over the operations of the regular drivers, letting them

Form No. 33

Spokane, Portland and Seattle Transportation Company

TIME AND WORK REPORT

Driver_____ Date_____

TRIPS

Stage Number	Car Number	FROM	Time	TO	Time

REMARKS: _____

Drivers will submit this report daily to Superintendent. Under "Remarks" report any unusual occurances or suggestions for betterment of the service.

Driver's Work Report

work by timetable. All overload business, however, is handled by the dispatching system.

Other Operating Methods

The motor coaches used by the regular drivers of the transportation company are assigned to them for their sole use. The drivers pick up their coaches at the company garage and drive them to the station where passengers are loaded. All drivers work six days a week and are paid on an hourly basis, allowing for the scheduled number of hours per trip made. They are, however, paid for the full number of hours required to make any trip, plus 15 minutes pay for servicing the coach. The average pay of the regular drivers is about $175 a month. The drivers regularly operate their cars 140 to 210 miles per day.

The company insists that applicants for drivers' positions must have had experience in operating motor coaches or motor trucks sufficient so that it will be necessary only for them to learn the system of accounting used by the S. P. & S. and to familiarize themselves with its routes. The management is not inclined to teach applicants for drivers' positions how to run a motor coach, having found that there are plenty of drivers available who have had either motor coach or motor truck experience.

The garage foreman at Portland tests the driving skill of driver applicants and such applicants must pass the test with a perfect record in order to secure consideration. Applicants are also given a thorough physical examination by railway physicians. All drivers who are off duty on account of sickness or an operation are subjected to a similar physical examination before they are permitted to return to work. Drinking by the drivers is not tolerated when they are either on or off duty.

Two reports are turned in to the superintendent by each driver daily. One of these, the time and work report, shows the name of the driver and the date, the number of the motor coach, its starting point and the time of starting, the destination point and the time of arrival, and spaces for remarks, under which reports of unusual occurrences or suggestions for the betterment of the service are made.

The other report, called the "operator's report of passengers on and off car", bears on one side the record of cash fares collected, for which cash fare receipts are given, and of tickets collected, all of which are turned in to the passenger bureau of the accounting department of the railway at Portland. On the front side of this report are spaces to show the trip number and the date, the name of the operator and his car number, the departure and destination points, the times of departure and arrival and the mileage covered. Below is shown a list of the stations on the transportation company's routes with spaces on each side to show the number of passengers on or off at those points, both eastbound and westbound. The drivers are required to enter the number of passengers on and off the coaches at the time of collecting cash fares or tickets, and these are totalled at the end of the day.

This report of the number of passengers handled on each run is submitted to the general manager and the general passenger agent. It is useful in showing where traffic is running heavy or where it is running light, and affords a check on the adequacy of the existing service. By means of this check the company can determine where additional service is necessary or where less service will meet all requirements.

The principal garage of the company is located at Portland with a garage foreman in charge. An assistant garage foreman is located at Astoria. In addition, there are the other company garages at St. Helens, Vernonia and Rainier. The coaches are serviced after each 105 miles of operation. This servicing consists of the

LANE-WILES STANDISH CO. FORM 18

Spokane, Portland and Seattle Transportation Company

TRIP NO. _____ DATE _____ 192__

OPERATOR _____ CAR NO. _____

LEAVING _____ AT _____ A.M. P.M. MILEAGE

ARRIVING _____ AT _____ A.M. P.M. _____

OPERATORS' REPORT OF PASSENGERS ON AND OFF CAR

NO. OF PASSENGERS ON WESTBOUND	STATIONS	NO OF PASSENGERS OFF WESTBOUND
	PORTLAND	
	LINNTON	
	BURLINGTON	
	HOLBROOK	
	ROCKY POINT	
	HAVLICKS	
	SCAPPOOSE	
	HONEYMAN	
	WARREN	
	McNULTY	
	ST. HELENS	
	COLUMBIA CITY	
	DEER ISLAND	
	TIDE CREEK	
	GOBLE	
	PRESCOTT	
	RAINIER	
	MAYGER ROAD	
	DELENA	
	BEAVER FALLS	
	INGLIS	
	CLATSKANIE	
	MARSHLAND	
	WOODSON	
	KERRY	
	WESTPORT	
	WAUNA ROAD	
	CLATSOP CREST	
	OREGON TIMBER	
	BLIND SLOUGH	
	KNAPPA ROAD	
	SVENSON	
	FERN HILL	
	JOHN DAY RIVER	
	ASTORIA	
	TOTAL	

OPERATORS MUST ENTER THE NUMBER OF PASSENGERS "ON" AND "OFF" CAR AT TIME OF COLLECTING CASH FARES OR TICKETS

Daily Report of Passengers On and Off at Various Stations

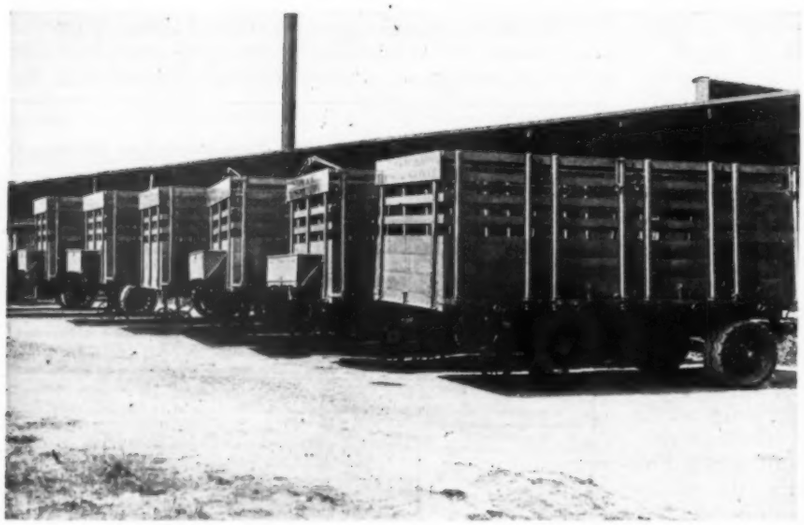
checking of gasoline and oil and the washing, cleaning and inspection of the cars. All cars are washed and inspected at the end of each trip.

At the present time, in addition to converting the sedan-type coaches into parlor-type coaches, their color is being changed to orange with a yellow belt. Wicker chairs with air cushion spring seats and arms are being installed. The coaches are being equipped with one row of seats down the righthand side of the coach facing forward and seats in pairs staggered on the lefthand side of the coach.

The maintenance methods in use on the Spokane, Portland & Seattle Transportation Company will be described in a later issue of the *Motor Transport Section.*

L. C. L. Traffic Recovere

Boston & Maine also expedi
by highway moveme
from which throu



A Line-up of Semi-trailers Used in Boston Transfer and Suburban Operations

UNDER a comprehensive plan of expedited service for l.c.l. freight, and in accordance with intensive efforts to recover its losses of this class of traffic, the Boston & Maine, in conjunction with its highway subsidiary, the Boston & Maine Transportation Company, has, during the past year, inaugurated extensive freight trucking activities throughout the eastern part of the territory which it serves. These trucking activities have been expanded and highway routes extended so that, at the present time, practically all l.c.l. collection and distribution by local freight trains on the road's Portland division has been discontinued with a diversion of this work to the trucks of the Boston & Maine Transportation Company.

Daily Operation Over 682 Route Miles

The highway subsidiary now has in daily operation an average of 682 freight truck route miles, excluding the transfer operations at Boston. An average of 2,948 truck miles are operated daily over these routes and in the Boston transfer service, the latter being a movement between rail terminals and between rail and steamship lines. In addition 108 truck miles are operated daily over 31 route miles for the handling of express traffic. An average of 61 trucks, 28 semi-trailers and 14 tractors are required for this daily operation.

During the first six months of this year a total of 114,768 tons of l.c.l. freight were handled by trucks. Very little carload freight is trucked, save an occasional transfer movement at Boston. Coal, however, is sometimes trucked in cases where this is deemed more expedient than a rail movement. The coal moved by truck during the first half of 1928 amounted to 15,363 tons.

In the performance of services which are in lieu of Boston & Maine rail services, the movement is from station to station and contemplates no store-door collection or delivery of freight. In its capacity as a trucking concern, however, the Boston & Maine Transportation Company offers a collection and delivery service within the cities where its trucks operate. If this service is accepted by Boston & Maine patrons for a movement to or from a Boston & Maine station, the Boston & Maine Transportation Company collects from the patron an independent charge which is in addition to the payment made to the railroad.

Time Saving of 24 to 72 Hours

Greatly expedited service has been the result of these trucking activities, according to the experience of the Boston & Maine traffic department. The saving in time on freight in transit has been found to be from 24 to 72 hours. This has aided the railroad in regaining lost l.c.l. traffic, for, in the Boston suburban area, where the service was first inaugurated from nine stations in the summer of 1927, an increase of more than 75 per cent in l.c.l. traffic is noted. Some of this freight formerly may have been trucked into Boston freight houses of the Boston & Maine by suburban shippers, but it is felt, nevertheless, that the amount of new business gained or old business recovered is considerable.

As to definite figures on savings which the trucking brings as compared to the former rail movement, no statistics have been worked out. It is pointed out that the rapid development of the service and the many angles to the situation makes it most difficult to assemble any representative figures on savings at the present time. The expedited service resulting in increased business is emphasized as the outstanding advantage which the trucking activity has brought to the railroad. It is of interest, however, to note that of the $13,854 profit reported in 1927 for the Boston & Maine Transportation Company, $12,818 was due to the trucking operations.

Small Trucks Used in Store Door Service at Boston

The Boston & Maine Transportation Com-

y Motor Truck Operation

service from 24 to 72 hours
concentration points
rs are forwarded

Trucks Used at Salem, Mass., Dover, N. H., and Biddeford, Me., Concentration Points

pany owns no vehicles but conducts its freight operations solely through contract truckmen. The motor coaches are owned by the Boston & Maine, which leases them to its highway subsidiary.

Shortly after its first motor coach route was established in May, 1925, the trucking activities of the Boston & Maine Transportation Company were inaugurated. The first operation was an over-the-road service in both directions between Boston and Lawrence and between Boston and Lowell. It is a trucking service solely, in which the Boston & Maine does not participate other than to permit the use of its stations in accordance with its contract with the transportation company.

Four rates are provided for this service: Station to station without any cartage service; station to station with cartage service at one end; station to station with cartage service at each end; and cartage service within the cities of Boston, Lawrence and Lowell. Each of these cities is zoned and rates vary both according to zones and to the total weight of each shipment. Rates for the over-the-road service vary from 17 to 58 cents per 100 lb. depending on weight of shipment and the zone in each city to or from which trucking is performed. Rates for cartage service within the three cities are similarly determined and vary from 6 to 23 cents per 100 lb., with minimum charges ranging from 40 cents to $1.00.

Not all commodities are accepted for transportation in this service at the regular rates. A list of exceptions, embracing articles of unusual size, or of great value, or articles of great bulk as compared to weight is published with the rate folder to indicate what goods require special quotations.

In addition to the service which it provides patrons within the cities of Boston, Lawrence and Lowell, this over-the-road trucking affords an overnight service between Lowell and New York, and Lawrence and New York. This is accomplished by combination truck and boat tariffs filed with the Shipping Board by the Eastern Steamship Lines. The Boston & Maine Transportation Company, as well as certain independent trucking organizations, acts as an agent of the Eastern Steamship Lines under these tariffs which apply only on cotton and woolen goods. The rates quoted in these tariffs include store-door collection in both Lawrence and Lowell. Trucks leave these cities around noon with freight which is delivered by the steamers in New York on the following morning.

This Boston, Lowell and Lawrence service, it is stated, was inaugurated as an experiment to meet an apparent growing demand on the part of railway patrons for store-door service and also to regain traffic which had been lost to truckmen. This business has grown and continues to grow although industrial conditions at times have caused less tonnage to be handled than in a previous comparable period.

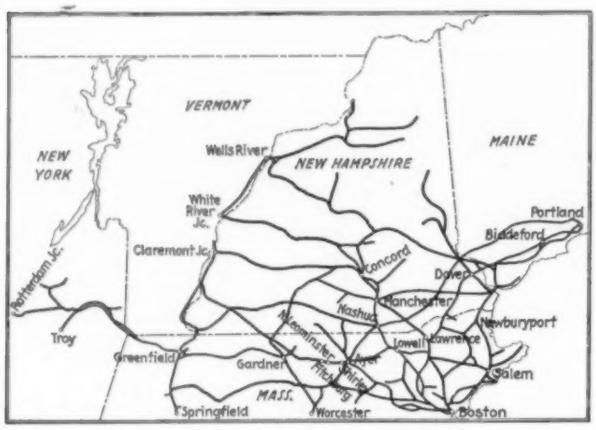
Attitude of Shippers

As a result of its experience in the operation of these routes the Boston & Maine Transportation Company has noted two dominant trends of thought among shippers with respect to freight trucking. One group feels that it must make use of the truck because it is a modern means of transport. This group is found to accept the service of the transportation company almost as soon as trucks are placed in service. The reason is considered to be the transportation company's association with the railroad and the reputation of the latter as a reliable transportation agent. The responsibility of the Boston & Maine Transportation Company for loss and damage is also thought to influence this group. A second group is noted which is reluctant to dispense with the services of local truckmen who have done their hauling for a number of years.

Shortly after the establishment of the Boston, Lowell and Lawrence routes, the Boston & Maine Transportation Company took over the transfer of Boston & Maine freight at Boston. These operations involve move-

Tractor Starting Out with Semi-Trailer from Freight House "A" at Boston

ments between Boston & Maine freight houses, and between the Boston & Maine and other railroads and steamship piers. For a number of years this transfer which is mainly of l.c.l. freight, was done by several different contractors. In May, 1925, however, when the



Map of Boston & Maine, Showing Concentration Points in Freight Trucking Area

transfer work was taken over, a contract for these Boston operations was given to one trucking concern.

Transfer Freight Kept Out of Houses

Substantial savings in these operations are made by keeping much of the transfer freight out of the Boston freight houses. Transfer cars and cars with a predominance of transfer freight are placed for unloading on team tracks at Boston where portable platforms, the height of car floors, are available to facilitate the loading of trucks. These platforms are readily hauled into place by a truck or tractor. As many as 57 cars of transfer freight have been handled in one day at this yard. The placement of the incoming car is determined by the type of freight which predominates in its load. If house freight predominates, the car is placed at the house and the transfer freight loaded into trucks there; if transfer freight predominates, the car is placed in the bulk yard where the house freight is unloaded and trucked to the house while what remains is moved to the transfer point. This method serves to speed service since freight can be obtained from cars in the yard more quickly than would be possible at the houses. It also relieves congestion at the houses.

Expansion Began a Year Ago

During the two years following its organization, the Boston & Main Transportation Company did little trucking outside of the Boston transfer work and the Boston, Lowell and Lawrence service. In the summer of 1927, however, an extension of trucking activities was begun in connection with the effort to recoup losses of l.c.l. traffic and to speed service on this class of freight. It was decided to establish concentration points to and from which freight originated at or destined to smaller nearby stations would be trucked. These concentration points and stations within each concentration area are shown in an accompanying table.

A start was made at Boston which is surrounded by a large producing area. The three railroads serving Boston are competitors for much long-haul traffic originating in this area. Also, since Boston is a large consuming center, there is of necessity a vast amount of trucking into the city from this surrounding industrial territory.

Boston Concentration Established

A plan therefore was decided upon which contemplated the substitution of truck for car movement of all l.c.l. freight between Boston and a selected number of stations within a 10-mile radius. These stations are listed in the table. This is a service in lieu of rail movement in which the transportation company acts as agent of the railroad and railroad tariff rates prevail. It is limited to l.c.l., and, as stated in the foregoing, has resulted in a saving of many hours on freight in

Concentration Points and Destinations in B. & M. Freight Trucking Plan

Boston, Mass. Concentration

Cambridge, Mass.	Medford, Mass.	Stoneham, Mass.
Chelsea, Mass.	Melrose, Mass.	Wakefield, Mass.
Edgeworth, Mass.	No. Somerville, Mass.	Waltham, Mass.
Everett, Mass.	No. Woburn, Mass.	Watertown, Mass.
Fells, Mass.	Oak Grove, Mass.	W. Medford, Mass.
Glenwood, Mass.	Reading, Mass.	Winchester, Mass.
Malden, Mass.	Woburn, Mass.	

Biddeford, Me. Concentration

Saco, Me.	Westbrook, Me.	Wescott, Me.
Old Orchard, Me.	Gorham, Me.	Waterboro, Me.
Scarboro Beach, Me.	Buxton, Me.	Alfred, Me.
Pine Point, Me.	Bar Mills, Me.	Kennebunk, Me.
Cumberland Mills, Me.	Bradbury, Me.	West Kennebunk, Me.
	Wells Beach, Me.	

Concord N. H. Concentration

Bradford, N. H.	Garrison, N. H.	Newport, N. H.
Contoocook, N. H.	Lake Sunapee, N. H.	Sunapee Depot, N. H.
Edgemont, N. H.	Newbury, N. H.	Warner, N. H.

Dover, N. H. Concentration

Barrington, N. H.	Gonic, N. H.	Newfields, N. H.
Bayside, N. H.	Greenland, N. H.	Newmarket, N. H.
Breakfast Hill, N. H.	Hampton, N. H.	No. Berwick, Me.
Cummings, Me.	Hampton Falls, N. H.	No. Hampton, N. H.
Durham, N. H.	Hedding, N. H.	Rindgemere, N. H.
Eastwood, Me.	Jewett, Me.	Rockingham, N. H.
Eliot, Me.	Lee, N. H.	Salmon Falls, N. H.
Epping, N. H.	Littlefield, N. H.	So. Berwick, Me.
Exeter, N. H.	Madbury, N. H.	Stratham, N. H.

Fitchburg, Mass. Concentration

No. Leominster, Mass. Shirley, Mass.

Lawrence, Mass. Concentration

Andover, Mass.	Haverhill, Mass.	Powwow River, N. H.
Atkinson, N. H.	Hubbard, N. H.	Raymond, N. H.
Ballardville, Mass.	Londonderry, N. H.	Salem, N. H.
Boxford, Mass.	Lowell, Mass.	Salisbury, Mass.
Bradford, Mass.	Lowell Jct., Mass.	Sandown, N. H.
Byfield, Mass.	Machine Shop, Mass.	Seabrook, N. H.
Canobie Lake, N. H.	Merrimac, Mass.	So. Middleton, Mass.
Derry, N. H.	Methuen, Mass.	Topsfield, Mass.
E. Kingston, N. H.	Newbury, Mass.	Ward Hill, Mass.
Forge Village, Mass.	Newburyport, Mass.	W. Chelmsford, Mass.
Fremont, N. H.	Newton, N. H.	W. Epping, N. H.
Georgetown, Mass.	Newton Jct., N. H.	Westford, Mass.
Graniteville, Mass.	No. Andover, Mass.	Westville, N. H.
Groveland, Mass.	No. Chelmsford, Mass.	Willey, N. H.
Hampshire Road, N. H.	No. Reading, Mass.	Wilson, N. H.
Hampstead, N. H.	Plaistow, N. H.	Windham, N. H.
	No. Wilmington, Mass.	Tewksbury, Mass.

Manchester, N. H., Concentration

Auburn, N. H.	Candia, N. H.	Massabesic, N. H.
	E. Candia, N. H.	

Newburyport Mass. Concentration

Newbury, Mass.	Salisbury, Mass.	Seabrook, N. H.

Nashua, N. H. Concentration

Anderson, N. H.

Salem, Mass. Concentration

Beverly Farms, Mass.	Ipswich Mass.	Rowley, Mass.
Danvers, Mass.	Magnolia, Mass.	Tapleyville, Mass.
Danversport, Mass.	Manchester, Mass.	W. Peabody, Mass.
Essex, Mass.	Marblehead, Mass.	
Hamilton and Wenham, Mass.	Rockport, Mass.	

transit. Freight is picked up and delivered at stations, but store-door service is available at some points through the transportation company, at a charge above the published tariff. Rates on this store-door service, which is mainly collection, vary from five to eight cents per 100 lb.

At the present time 20 stations are included in this Boston suburban operation. Freight is gathered daily from these stations by the trucks of the transportation company and hauled into Boston freight houses where it is loaded into cars for forwarding. A total of 83 merchandise cars are regularly made up each day at the Boston houses for points off the Boston & Maine lines, while 97 cars local to the Boston & Maine are forwarded daily from these houses. Thus, by reason of the trucking service, space is available in these cars for shippers of the Boston suburban area.

Likewise, on the inbound movement, freight consigned to these suburban points is loaded in Boston cars, thence to be trucked to destination by the transportation company.

Since this suburban operation started in the summer of 1927 and was well under way by the first of the current year, a comparison is possible between tonnage trucked from a selected number of these stations during the first six months of 1928 and that forwarded by rail during the first half of 1927. During the first six months of 1928 a total of 14,337 tons were forwarded by truck from these selected stations which enjoyed the service from the outset. This compares with 7,900 tons forwarded by rail during the corresponding period of 1927—an increase of 81 per cent. Some of this freight, as stated above, may have been trucked by shippers into the Boston houses before the inauguration of the service, but it is felt that most of it represents new business.

Some Stations Still Receive Cars

Some of these Boston suburban stations still receive l.c.l. freight in cars from distant transfers. These cases, however, are exceptions where neither improved service nor economies would result from a substitution of trucks. Also an occasional car is used to handle a cumbersome piece of machinery or commodities which do not readily lend themselves to truck movement.

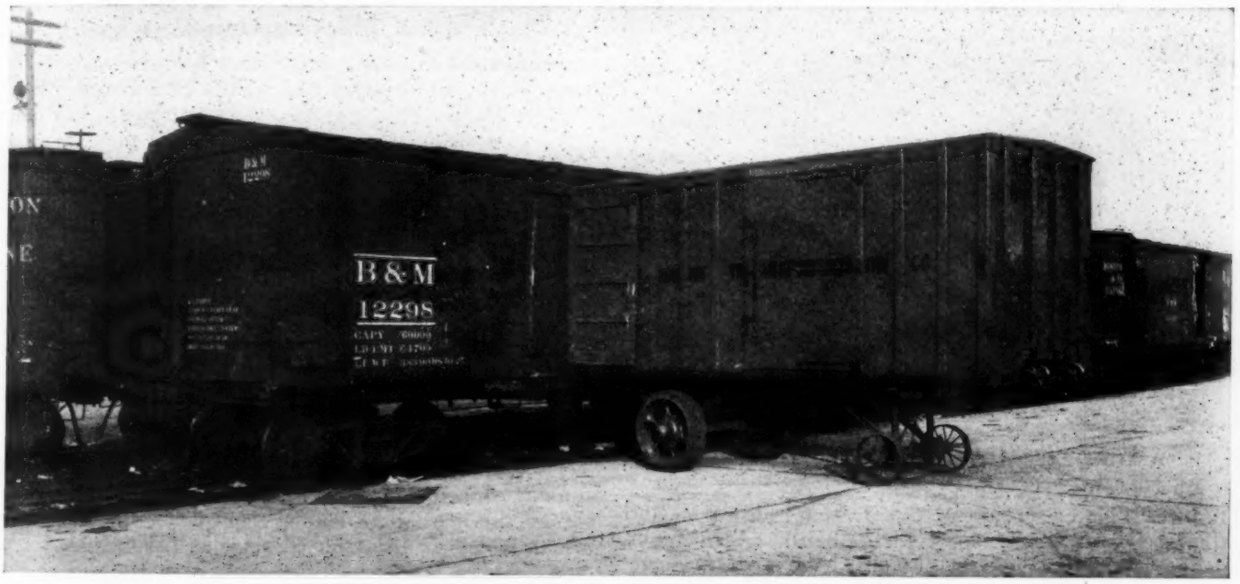
Examples of Time Saving

A concrete example of the time saved by the establishment of Boston as a concentration point is had if it be assumed that a shipment of l.c.l. freight originated at Manchester, N. H., for delivery in Everett, Mass. Under the previous set-up, a car was made up at Lawrence, Mass., for Everett, but Manchester did not load a regular car for Everett, nor one for Lawrence. Consequently the Manchester agent would load the Everett shipment into a car for Nashua, N. H., where it would be transferred into a Lawrence car, since Nashua loaded none for Everett. At Lawrence the shipment would again be transferred into the car for Everett, making necessary two transfers enroute.

At present such a shipment would be loaded into a Boston car at Manchester and upon arrival would be trucked to Everett the same day. While the example is of an exceptional case, it nevertheless serves to illustrate the possibilities for time saving which the concentration affords.

A more typical example would be a shipment from Greenfield, Mass., to Woburn, Mass. This was formerly loaded into a car for Nashua, N. H., where it was transferred into a car for Woburn. Now such a shipment would be loaded into a Boston car and trucked to Woburn with a saving of 25 hours in time.

Thus it will be seen also that freight handling at interior Boston & Maine transfers has been lessened since most of these points always loaded cars for Boston into which Boston suburban freight can now be placed.



Enclosed Semi-trailer Backed Up to Car of Transfer Freight, Water Street Yard, Boston Terminal

Local Freight Train Displaced by Truck

In August, 1927, the trucking service was established on the Boston & Maine Claremont Branch between Concord, N. H., and Newport, N. H., with Concord as the concentration point. Stations affected are shown in the accompanying table. At this point the trucking operations enabled the road to discontinue a local freight

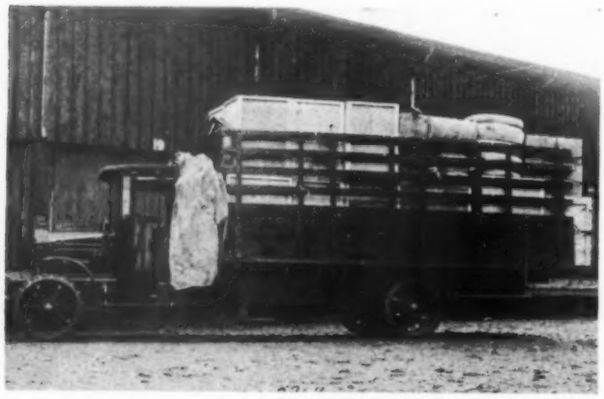
train with resultant savings estimated at about $45 a day.

One truck is usually all that is required for the work and this ordinarily arrives in Concord in time to permit the forwarding of freight the same night, thus giving an overnight service to Boston. The operation is essentially the same as that involving the Boston suburban stations which has been described. Outbound l.c.l. freight is trucked from the branch-line stations into Concord for forwarding while the inbound is loaded into Concord cars, thence to be trucked to destination stations.

Lawrence Concentration

In December, 1927, the service was further expanded by the establishment of Lawrence, Mass., as a concentration point with trucking service which now extends to approximately 50 outlying stations. These are shown in the table.

The establishment of the Lawrence concentration was the result of a desire of Boston & Maine traffic officers



A Truck Loaded With Boston Transfer Freight

to offer a better service to New England industries and thus get more business for the railroad. Accordingly a number of through merchandise cars operating out of Lawrence to important western and southern points were placed in service on December 1, 1927. The entire northeastern section of the Boston & Maine feeds this set-up. In all 225 stations load on Lawrence for transfer into these through cars. At the present time 37 scheduled cars are loaded at Lawrence each day for important off-line destinations while a like number are forwarded to Boston & Maine points daily.

Lawrence Suitably Located

Lawrence was selected for this major concentration because of its suitable location. It is situated on a main line from Portland, Me., to Boston, on a main freight route from Rotterdam Junction and Mechanicville, N. Y., to Portland, on a main freight route from Worcester, Mass, to Portland, and adjacent to a main freight route from Boston to Concord, N. H., and points north.

As an auxiliary feeder to the regular cars concentrated on Lawrence from the larger stations, the trucking service was established to the smaller points. This included at the outset all stations within the immediate vicinity of Lawrence as well as points between Lawrence and Manchester, N. H., and stations on the Stony Brook branch between Lowell and Ayer, including Lowell but not Ayer. Now the trucking activities, based on Lawrence, extend to practically all Portland division stations in the surrounding territory as will be seen from the list in the table.

The tonnage trucked to and from Lawrence during the first six months of 1928 was as follows:

Jan.	786 tons	April	1201 tons
Feb.	812 tons	May	2001 tons
Mar.	991 tons	June	1895 tons

It is pointed out, however, that this increase represents the addition of new stations, since the service has not been in operation long enough to make a comparison with the former rail movement from these stations.

Beginning in July, 1928, new major concentration points were established at Salem, Mass., Dover, N. H., and Biddeford, Me., with other concentration centers at Newburyport, Mass., Manchester, N. H., and Nashua, N. H. The stations involved in these operations are also shown in the table. Thus as was noted at the outset, practically all l.c.l. peddling and collection by local freight train crews on the Boston & Maine Portland division have been discontinued.

Other Trucking Operations

Trucking was also recently started between Fitchburg, Mass., and Shirley and North Leominster, Mass. The reason for this was to avoid stopping through trains to unload l.c.l. freight or set off or pick up merchandise cars. Boston formerly made one car for Shirley and North Leominster. A through train stopped at Shirley to unload the freight for that station and then continued on to set off the car at North Leominster. At present Shirley and North Leominster freight is loaded into a Fitchburg car and trucked from there while the outbound tonnage from the two stations is trucked into Fitchburg for loading into cars. This change has resulted in a 24-hr. saving on most outbound freight from both Shirley and North Leominster.

Another operation is that between White River Junction, Vt., and Westboro, N. H., where a truck movement was substituted for rail service because the small amount of l.c.l. tonnage did not warrant the use of a car or the special switching required. For the same reason freight is also trucked between Lynn, Mass., and Swampscott, Mass., and between Lowell, Mass., and Tewksbury, Mass.

A special route has been established for the summer between Plymouth and Lincoln, N. H., for the handling of baggage and express. Express is also handled by truck between Haverhill and Merrimac, Mass.

Ten Trucking Concerns Employed

In all, ten trucking concerns are under contract with the Boston & Maine Transportation Company. In some cases, the payment to these firms includes the pay of the driver while the helper is usually an employee of the transportation company. Railroad station forces are also used to load and unload trucks. In the service which it performs for the Boston & Maine, the transportation company is paid on a cost plus basis.

Basis for Payment to Contractors

The basis for payment to contractors varies but the most common is a combination hourly and mileage rate. The hourly rate is calculated to cover the fixed charges of the contractor, including pay of drivers and in some cases of helpers. The mileage rate is fixed to cover operating expenses and profit.

A second basis is the payment of a straight rate per trip. This is used largely in the part-time operations and in detached operations to which constant supervi-

sion cannot be given. The third basis, involving a payment per ton or per 100 lb., is in vogue principally in local collection and delivery service. Some of these contractors do other trucking work but they are required by their contract to provide a sufficient number of vehicles to handle the Boston & Maine Transportation Company's traffic at all times, and to maintain these vehicles in a condition satisfactory to the transportation company.

The contract for the Boston transfer and Boston suburban trucking where specialized equipment, such as tractors and semi-trailers, is used provides that, if cancellation notice is served upon the contractors, the Boston & Maine Transportation Company must take over the equipment now assigned to its service. If the contract be cancelled by the trucking concern, the Boston & Maine Transportation Company, may at its own option, take over the equipment which is regularly used in its service. The former provision protects the trucking company which has a substantial investment in equipment unsuited to non-railroad work; the latter provision protects the transportation company from the possibility of the trucking company withdrawing its equipment and using it contrary to the interests of the transportation company.

Handling of Loss and Damage Claims

Loss and damage claims are paid by the Boston & Maine claim department and then collected from the contract truckmen, if the latter are responsible. The experience has been, however, that such claims are few on freight moved by truck. All contract truckmen are bonded for the satisfactory performance of their contract and the proper accounting for transportation company funds.

Trucks in use range in size from one to eight-ton types. Loads must conform to the limits fixed by the laws of the four states in which the company operates. Massachusetts has a 28,000 lb. gross weight limit, New Hampshire one of 20,000 lb., Maine, one of 18,000 lb., and Vermont, one of 16,000 lbs. Trucks and trailers used in its service bear the name of the Boston & Maine Transportation Company.

The preference for contract truckmen over the use of its own vehicles up to the present time has been based mainly upon a desire to utilize existing trucking organizations. Also it was realized that the railroad had no trucking experience and until an organization was developed the advantages were with operations through contractors.

Foremen Direct Truck Movements

To control operations, trucks are scheduled with foremen in charge of dispatching at Boston and Lawrence, the main concentration points. These foremen assign trucks on regular trips and also provide for such extra movements as are required. They are in touch with agents at the various trucking points, and, with information as to the amount of freight on hand at each of these stations, are able to provide for its prompt movement to the concentration point.

In addition five inspectors are employed by the Boston & Maine Transportation Company to cover the trucking territory. The duties of the inspectors are to see that the contractor performs his work properly; to rearrange schedules and routes as traffic requires; to supervise foremen; to investigate complaints concerning service; and to obtain data on projected extensions. They are required to ride over each trucking route periodically in the performance of these duties.

S. A. E. Questionnaires Seek Maintenance Data

QUESTIONNAIRES on motor coach and truck maintenance were recently mailed to operators of large fleets of these vehicles by the Operation and Maintenance Committee of the Society of Automotive Engineers. This committee represents the motor-vehicle fleet-operating membership of the society and is concerned with the development and advancement of engineering and technical research activities relating to motor vehicle operation and maintenance.

The questionnaires are designed to secure the facts, particularly with regard to the cost of man power required for vehicle maintenance, and thus the fundamental information which determines these costs is sought.

Two separate questionnaires were sent out—one on motor coach maintenance and the other on motor truck maintenance. Fourteen questions are asked in each, the questions being identical in the two questionnaires save for the initial query which, in the one case calls for a classification of motor coaches by types, while in the other a like request is made with references to the listing of motor trucks by classes.

The listing form accompanying this initial question on the motor coach questionnaire distinguishes six types of vehicles as follows: city, suburban, parlor coach, raised-deck parlor coach, sedan and double-deck. Each of these types is defined to aid in a proper listing. A space is also provided to enter the seating capacity of each vehicle listed.

A truck questionnaire lists five body types and in addition seeks information as to weight and the number of trailers and tractors in operation. The types are: panel, screen side, platform, dump and tank.

The remaining thirteen questions on each of the questionnaires are as follows:

2. What is the total annual maintenance mileage of your fleet?
3. What percentage of your annual maintenance cost is represented by work done in outside shops?
4. What percentage of your total annual maintenance cost is work done due to accidents? (In figuring this percentage please use the gross cost of accident repairs without any deductions for amounts recovered from insurance companies or from other parties.)
5. What percentage of your annual maintenance cost is represented by non-productive labor such as clerical help, supervision, stock clerks, etc.?
6. What is the average number of men employed for garage service which includes supplying gasoline, oil and water, routine inspection, tire inflation, adjustment lubrication and washing?
7. What is the average number of men employed on repair work?
8. If the same crew of men handle both garage and repair maintenance work, what is the total number of men employed for this service and how is their time divided between garage service and actual repair maintenance work?
Percent of time on garage service.
9. How many hours per month do your maintenance men work?
10. How many hours per month are charged to washing and cleaning?
11. What is the maximum and minimum number of maintenance men employed during the year?
During what month is the maximum number employed? The minimum?
12. What is the cost of mechanical labor per vehicle per day?
12(a). What is the cost of mechanical labor per vehicle per mile?
13. What is your cost of total maintenance labor per vehicle per day?
13(a). What is your cost of total maintenance labor per vehicle per mile?
14. Do you perform the following classes of maintenance in your own shop? Electrical; Carbureter; Tires; Radiators; Painting; Body repairs; Welding; Rebuilding complete units such as engines, axles, etc.

The reason for the questionnaires is the desire of the committee to evolve some uniform system of cost classification so that comparisons of the operating costs of one class of operator against those of another class or those of the small operator against the large one may be made directly.

Replies are now being received and it is planned to compile the resulting data in the form of a report which will form the basis of a discussion in conjunction with other phases of the committee's work at the National Transportation Meeting of the society to be held at Newark, N. J., October 17 to 19, inclusive.

Ohmer Ticket Printing Register

THE Ohmer Fare Register Company, Dayton, Ohio, has recently announced its new No. 80 type ticket-printing register which is of lighter and more compact design than any of its predecessors. The designers have incorporated a number of entirely new features in this register which mark an advance in the development of fare protection as well as greater simplicity and accuracy in the handling of business details. It has an untam-

The No. 80 Type Electrically Operated Register

perable mechanical tie-up between the amount, which is clearly indicated to the passenger when the fare is paid, the data printed on the ticket issued to the passenger, the complete printed detail strip which goes to the management, and the totals which are printed from time to time on the detail strip in a different color of ink, usually red. Any ticket issued can be quickly identified by number with the corresponding printed entry on the detail strip. The number of the operator, the trip, the date, the zone, the amount and the class of fare paid, are all clearly recorded and readily coordinated in auditing the returns.

Use of Register Speeds Loading

The use of this register permits speed in loading, as it requires a minimum of attention on the part of the operator. The amount of the fare to be registered is set up simultaneously within the machine, and also on the visible indicator on the top. This is accomplished by a simple and convenient arrangement of operating levers. The operator knows, and the passenger sees exactly what is about to be registered before the operator completes the transaction by pressing the electric operating button or turning the operating handle. Fares of the same kind from other passengers, who may be rapidly entering the coach, are quickly registered by repeated pressure on the operating button.

Passengers going to different points on the line require a quick setting of one or more levers according to the amount and class of fare to be registered. The levers are so arranged that the operator can, with little practice, set them by the sense of touch alone without looking at the register. The amount and class of fare registered being clearly indicated at the top of the register, both to the front and rear, it is an easy matter for the other passengers or a checker on the coach, to note the successive registrations. This publicity of operation is a feature which has always been recognized as of considerable value. It discourages any tendency toward dishonesty on the part of the operator or passenger.

The auditing record obtained from the No. 80 type register is practically the same as that made by the Ohmer ticket and auditing machine which was described in the *Railway Age*, Motor Transport section for December 25, 1926, page 1305. The new register is made in special models for use in ticket offices, and prints tickets showing the name of the destination fully spelled out. Motor coach models print tickets with practically the same information and with the same arrangement as shown in the previous article. It shows only the destination by symbol or number.

Some of the new features which have been incorporated in the No. 80 type register include a fountain ink roll which is filled by practically the same method as a fountain pen. The ink reservoir contains a sufficient supply to print as many as 200,000 tickets and records without refilling. The use of ribbons in all of the Ohmer registers have been eliminated. The knife for cutting off the tickets is a complete assembly. It has

Manual Operated No. 80 Type Register Installed in a Motor Coach

no springs, is self sharpening and positive in its movement. It can be easily removed without the use of tools of any kind, which facilitates the inspection of the interior of the register. This register is constructed to be operated by either hand or motor power. With the hand-operating device, the register may be readily operated with the thumb and forefinger, turning the crank only one revolution. The electrically-operated register weighs 30 lb. and is 12 in. high, 9¼ in. wide by 6½ in. deep. The manually-operated register weighs 22 lb. and is 12 in. high, 6½ in. wide by 6½ in. deep.

The Pickwick "Nite Coach"

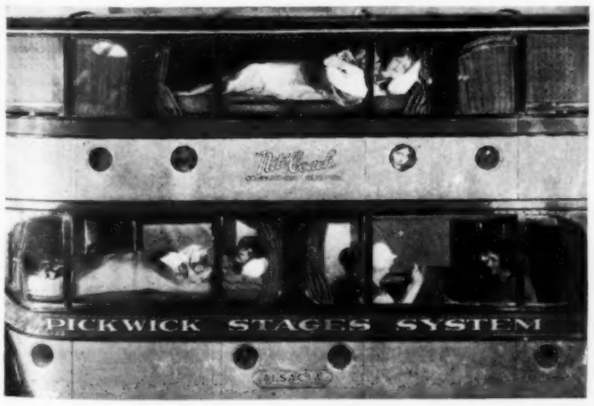
The Pickwick Motor Coach Sleeper

Sleeping accommodations for 26 passengers—Dining and lavatory facilities are included in the design

AN innovation in the field of night motor coach transportation has been introduced by the Pickwick Stages System, Los Angeles, Cal., with the building of a motor coach designed with sleeping accommodations for 26 passengers. This coach will operate over the Pickwick-California route between San Diego and San Francisco.

The sleeper coach, radically different in design and appearance than anything before built, was constructed entirely, including the engine, in the Los Angeles factory of the Pickwick lines. The stage, designated as a "Nite Coach," consists of two decks comprising thirteen compartments, in each of which two persons may sit or sleep. In addition to the sleeping accommodations, the coach has a complete dining service and lavatory; and there is running water in each compartment.

The coach is 34 ft. 6 in. in length, 8 ft. wide, 10 ft. 3 in. high, and weighs 14,000 lb. No wood is used in its construction. The entire coach, except the chassis, is constructed of a special metal which has the strength of steel and the lightness of aluminum. Shatter-proof glass is used.



Side View, Showing Staggering of Sections

How the Compartments Are Arranged

Sleeping accommodations for 26 passengers are made possible by staggering upper and lower compartments, which are reached by a single aisle serving both the upper and lower decks. A single step up or down, whichever the case may be, takes the passenger to his compartment on either deck. The center aisle, which is located halfway between the decks, is the key to the entire arrangement of the sleeper.

Each compartment is, in reality, a complete stateroom. Heavy sliding curtains provide privacy for each stateroom. During the day the passengers sit facing each other on deep-cushioned chairs.

Each stateroom has three windows and two portholes in addition to five electric lights individually controlled. A built-in thermos bottle for ice water and a polished nickel wash basin, using running water, are located in each compartment. There are two drawers for personal belongings, coat hangers, an electric fan, a ventilating system, and space for the storing of two full-sized suit cases. There is plenty of head room, as each room is more than 6 ft. high. The bed length is 6 ft. 4 in.

The beds are supported on a system of hinged rods and are 24 in. wide. Mattresses and cushions, linens and blankets make up the bed clothing. In addition to a sleeping capacity for 26 passengers, there are additional seats in the front and rear for 18 passengers which may be used by the occupants of the compartments while the berths are being made up, or for observation. Each compartment is supplied with warm air if desired.

The Kitchen Facilities

The coach is furnished with a kitchen and facilities for serving the passengers. The kitchen compartment is located in the space adjacent to the front entrance of

the coach. The door when opened for loading and unloading passengers, separates the kitchen from the entranceway. The kitchen equipment consists of an electric range, a refrigerator, a coffee percolator, food containers and space for cooking utensils and tableware.

Berths Ready for Sleeping

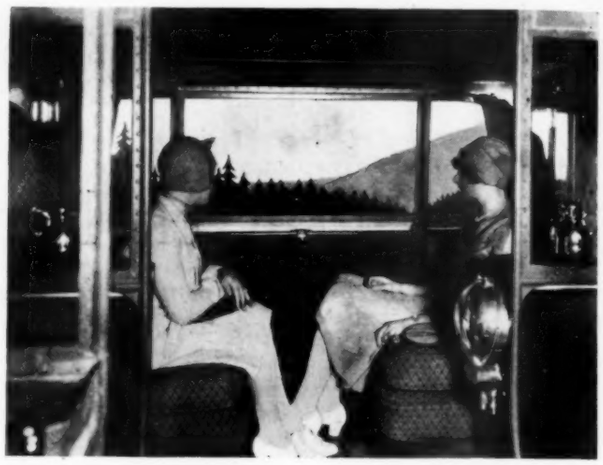
Table service is carried for 26 passengers. A regular menu is provided, and a passenger may, within reason, obtain a wide variety of food, even including small steaks, salads, sandwiches, soft drinks, ice cream, vegetables, etc. The food is served on trays which are placed on individual tables in the compartments.

The Construction of the Coach

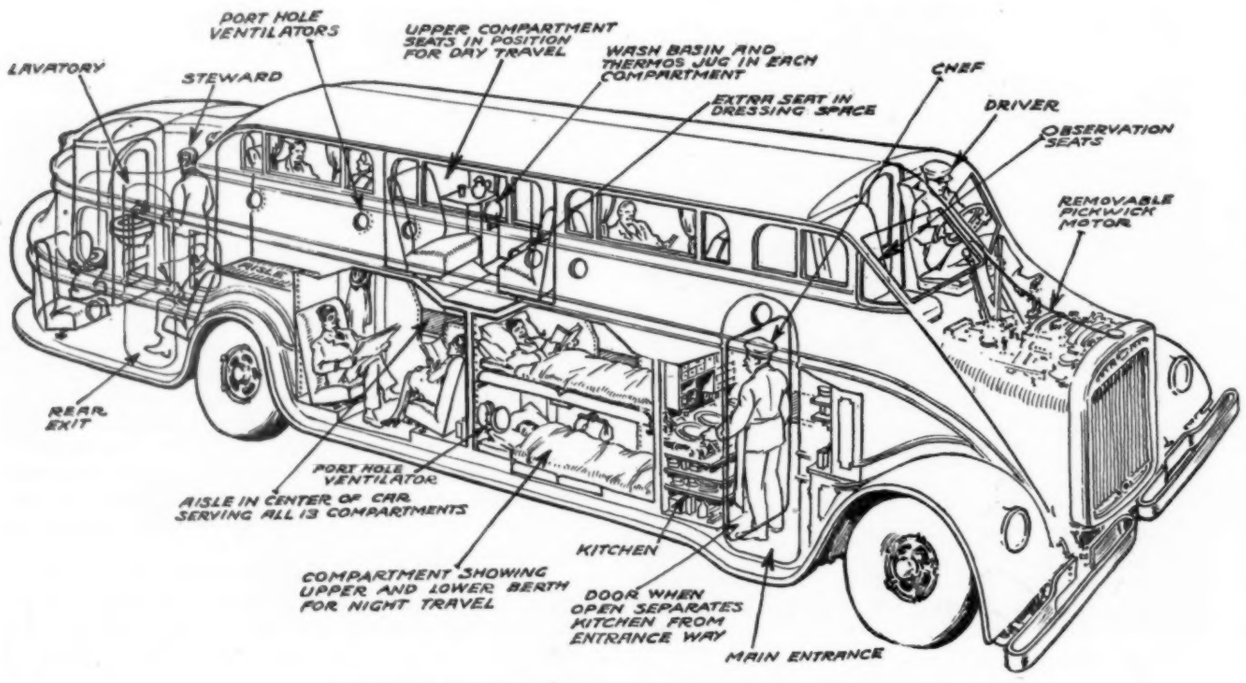
The construction of the coach is interesting in that it has no regulation chassis, as the coach is built as a unit. The frame and the body are riveted together. An I-beam circles the coach just below the lower deck windows. The passengers on the lower deck are inside this frame, which protects them from crushing in of the side of the coach body.

The coach has no motor hood. The operator sits in his compartment directly over the engine. His high vantage point enables him to see the road clearly for great distances ahead and to the side. A telephonic connection with the rear compartment, which is a lounging and smoking room, permits the operator to instruct the porter to keep a lookout back when it is necessary to back the coach.

Another unusual feature is the removable Pickwick motor. It is a six-cylinder, 110 hp. engine capable of driving the coach 50 miles or more an hour. By loosening several frame bolts, and the oil, gas and electric lines, the power unit may be slid forward and out of the frame. This feature is expected to reduce road delays, since a complete change of motor can be made in 15 min. Motors will be kept at all division points on the Pickwick system for use in emergencies.



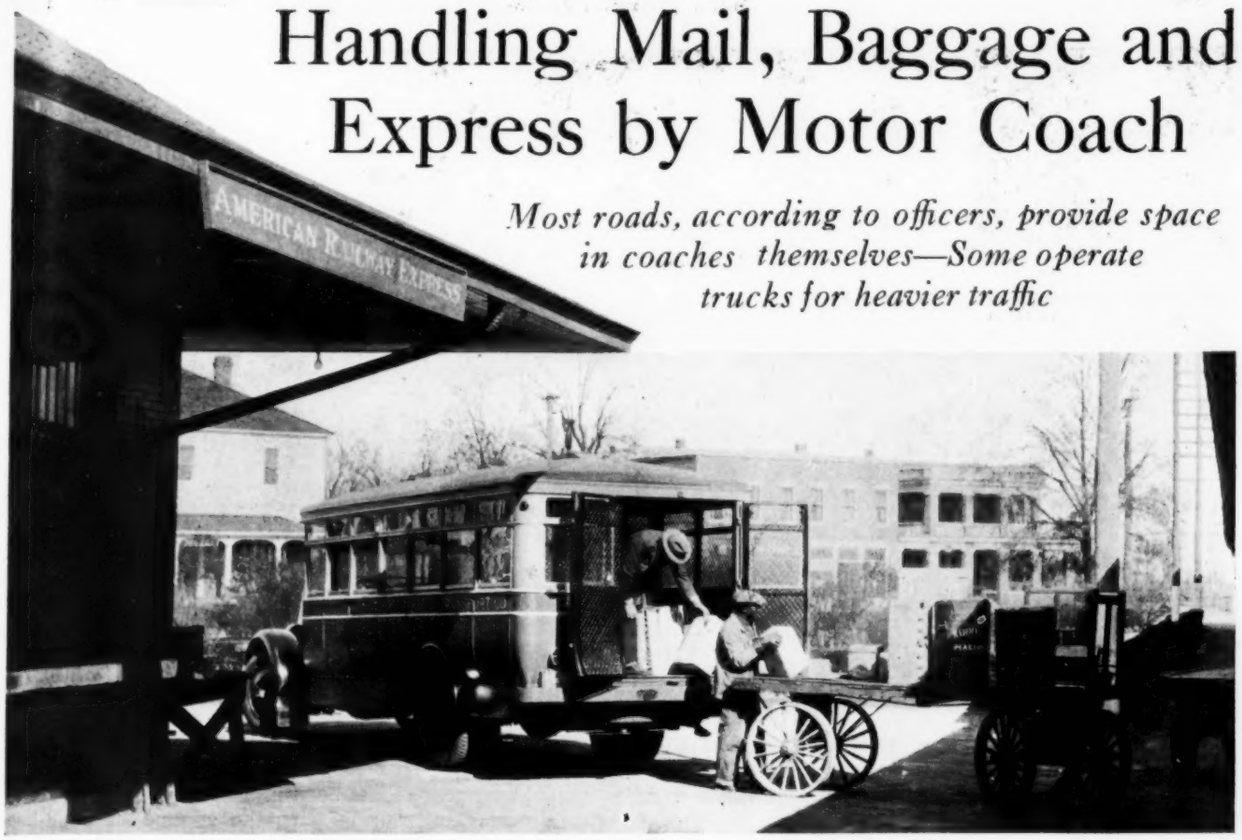
Seats arranged for day travel



Phantom Diagram Showing Arrangement of Facilities

Handling Mail, Baggage and Express by Motor Coach

Most roads, according to officers, provide space in coaches themselves—Some operate trucks for heavier traffic



A Mack Combination Passenger and Express Coach Used by Central of Georgia Motor Transport Company

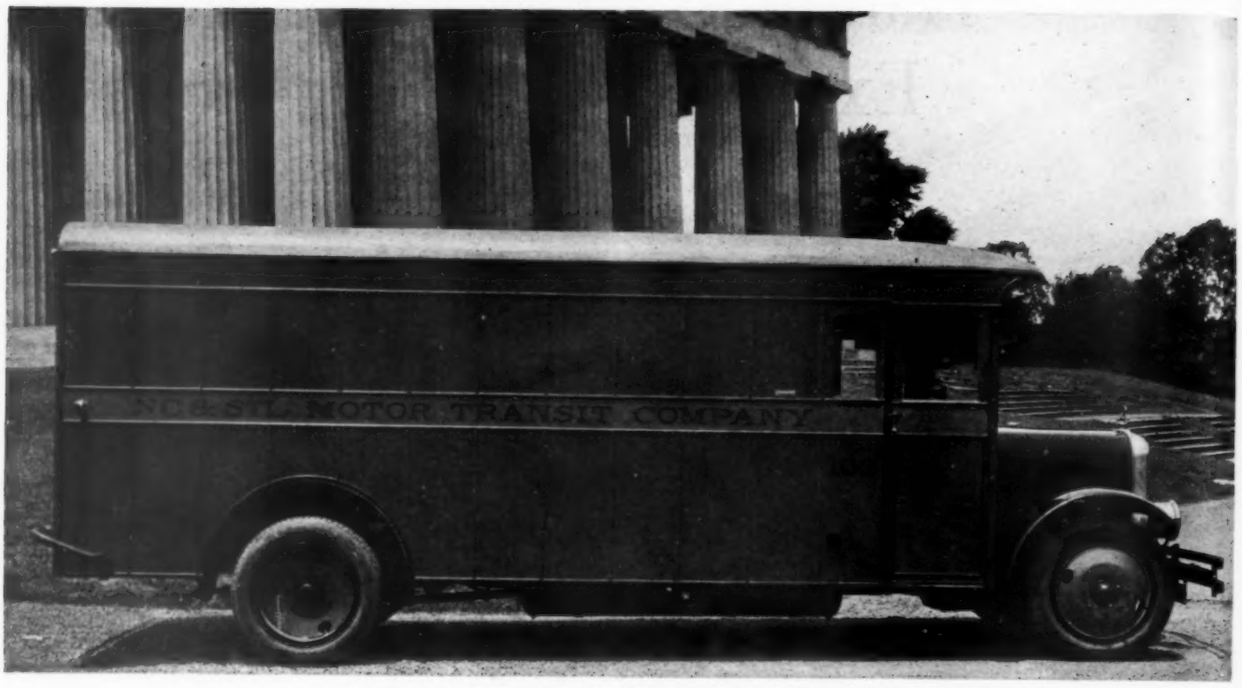
VARIOUS methods of handling mail, baggage and express on lines where motor coaches have replaced passenger trains are reported by officers in charge of railway motor coach operating companies, in response to a questionnaire. On a number of the roads, there has been no complete substitution of highway for rail service, with the result that mail, baggage and express, except the hand baggage carried by passengers, is still forwarded by the trains remaining in operation. Several companies, however, have had to develop unusual measures to meet the problem.

Very little mail, baggage and express was carried by the local trains of the New York, New Haven & Hartford which have been replaced by the motor coaches operated by the New England Transportation Company. Most of the baggage carried was hand baggage, according to F. S. Hobbs, general manager, except on the first route operated by the company, which was established in August, 1925. On this route there were approximately 70 mail pouches and about 1,000 lb. of express to be carried each day. The New England Transportation Company bid in the mail route and took over the handling of express for the New Haven and the American Railway Express Company, operating for this purpose a two-ton motor truck. Except in this one case, such mail, baggage and express as there is to be handled is now taken care of by the motor coaches.

In response to a question as to the provision of special equipment, Mr. Hobbs states that few changes have been made in the motor coaches to increase their cargo capacity. "Some of our coaches," says Mr. Hobbs, "are equipped to handle hand baggage on racks installed in the coaches. A large number of our coaches are equipped with what is known as a baggage compartment, 40 in. wide and having 36-in. doors on each side at the rear of the coach. This seems to answer the purpose on most of our routes. Our Boston-New York route is covered by coaches, which have the new observation parlor coach body, the observation deck of which seats 17 passengers, and the lower section, 12 passengers. In the rear, under the observation section, is the baggage compartment which contains space enough to accommodate about thirty grips and two steamer trunks. This compartment is weather-proof."

The Reading Transportation Company, according to A. C. Tosh, superintendent, has experienced no serious difficulty in connection with the handling of mail, baggage and express for the reason that in no case has steam train service been completely replaced by motor coach service. "In some instances," says Mr. Tosh, "the desired frequency of steam service may not be available for the transportation of mail, baggage and express, and we are called upon to transport first-class mail by motor coach or to make special arrangements for the forwarding of baggage cars carrying these classes of traffic for short distances in local freight trains. We have a clear space of 32 in. by the full width of our coaches, for the accommodation of a limited quantity of mail or baggage, and with these arrangements and facilities, no serious difficulties have been encountered."

Complete replacement of passenger train service was effected by the Nashville, Chattanooga & St. Louis on one of its branch lines in Tennessee. Referring to the handling of mail, baggage and express over this route, F. W. Kelsey, superintendent, says, "On the branch line where we substituted highway service for rail service, we handle mail, express and baggage on two of the four round trips daily with a van built on a coach chassis. Our mail, express and baggage on this line is



N. C. & St. L. Truck for Mail, Baggage and Express

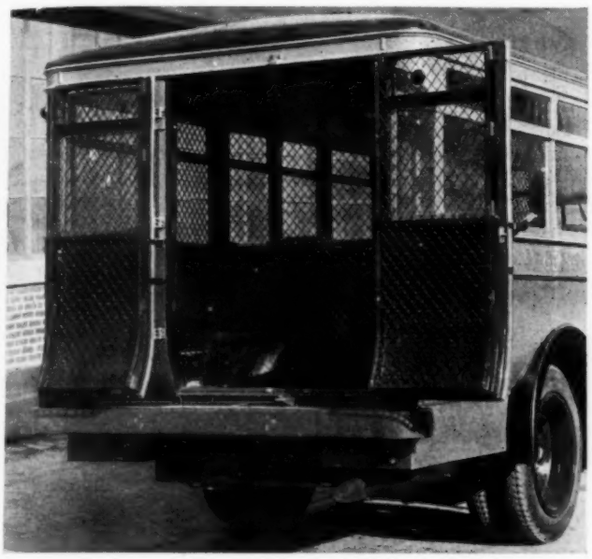
heavy during the summer months since the route leads to the mountains where there are a number of summer resorts. On the other two trips, we used a combination passenger and express car which was converted from an ordinary motor coach. During the winter months this combination car is sufficient to take care of all the business except on unusual occasions." In the combination car referred to, the long rear seat was removed and the space thus provided enclosed by wire screens. The combination car handles mail and baggage to and from two connections.

Describing the experience of the Boston & Maine Transportation Company, R. J. Littlefield, manager of motor coach service, says, "On the 10 routes where passenger train service has been replaced by highway service, either entirely or in part, the volume of mail has varied from 1 piece to 150 pieces per day. Baggage has ranged from 5 pieces to 200 pieces per day, and express between about the same limits. On most routes, baggage and mail are handled on our regular motor coaches. In some cases, it has been necessary to set aside the space of two seats; in other cases, the space of five and seven seats is used. Most of our coaches operating on such routes have baggage compartments especially built into the rear of the cars. Where the motor coaches cannot handle the mail and baggage, trucks are operated or arrangements have been made with other trucking concerns to handle such matter. Generally speaking we handle no express shipments on our motor coaches, except on routes where perishable express is handled. The express company makes its

An A.C.F. Parlor-Observation Coach with Baggage Compartment, Used by the New England Transportation Company

own arrangements and usually uses the remaining train service which, in some cases, is via freight. In other cases, their offices have been closed and distribution is made from larger and more distant points.

"Our present methods of handling mail, baggage and express are, on the whole, very satisfactory. In several



Rear Compartment of Combination Coach in Service of Central of Georgia

cases, mail is handled more directly than when it moves via rail. Because of the flexibility of the motor coach, more frequent mail service is provided, and in two or three instances earlier delivery of mail has been made possible."

The experience of the Southern Pacific Motor Transport Company is described by T. B. Wilson, vice-president and manager, as follows:

"With the exception of one or two cases, complete substitution has not been made on any particular line; in other words, there is at least one remaining passenger train on each route to which the heavy and bulky shipment can be diverted, leaving the motor coach to handle perishable and comparatively light rush shipments. However, we have recently effected a substitution for train service where the volume of express and mail is too great to handle on the motor coach, which has necessitated the operation of a motor truck for this purpose. We are watching this particular operation quite closely and to see if the operating expense is warranted.

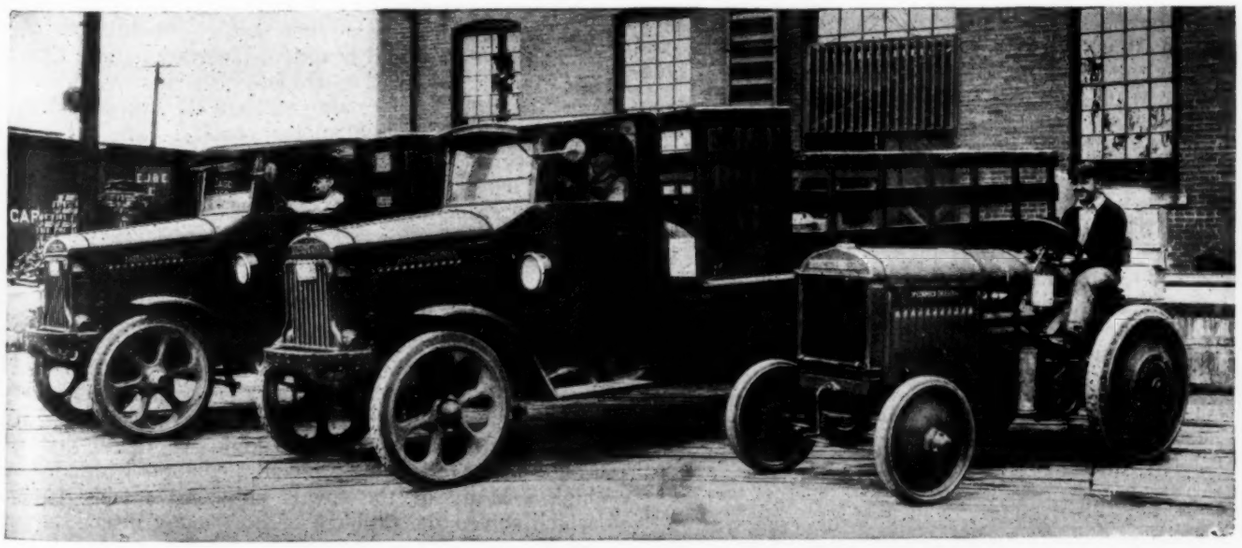
"In several of our coaches, the rear baggage department has been partitioned off from the passenger compartment. The baggage compartment will accommodate approximately one ton of mail, baggage and express and adequately meets our requirements on certain runs where the conventional type of roof baggage space is not sufficient. The baggage compartment is of the same width and height as the body and is approximately 45 inches in depth."

Prior to the establishment of the motor coach line of the Denver & Interurban Motor Company, according to W. H. Edmunds, vice-president and general manager, a considerable volume of first class mail, baggage and express was handled by the electric railway, which was replaced, the baggage and express going only to those points not served by the steam railway line of the Colorado & Southern. Mr. Edmunds describes the present practice of his company, as follows:

"First class mail is handled by motor coach to the same extent as it was formerly handled by electric train, and all baggage and express of a size to permit its being handled comfortably by motor coach is carried in the coaches to those places not served by the steam rail service. For articles too large to be handled by motor coach, arrangements have been made to have them handled by rail to the nearest delivery point and by private truck to the final destination.

"In securing the original equipment for the motor coach operation, considerable thought was given to this problem and all equipment was arranged so that the rear end is equipped only with 'jump-seats,' permitting the handling of a considerable amount of mail and express in the space occupied by these seats. This arrangement has worked out very satisfactorily, and there has been no necessity for making any change to date. No changes will be necessary unless the volume of the shipments should increase a very considerable amount, in which case, of course, additional space would have to be provided."

* * * *



Two Trucks and a Tractor in Service on the Elgin, Joliet & Eastern

Merchandising Motor Coach Rides

How the Philadelphia Rapid Transit Company sells transportation in its highway equipment

By E. A. Keenan
Advertising Manager, Philadelphia Rapid Transit Company

THAT the motor coach business must be merchandised has been proven beyond the shadow of a doubt. Competition with other lines of transportation, particularly the private automobile, is too keen for the motor coach operator who thinks that business will come to him without effort. There is no room today for the motor coach operator who frowns on advertising. We have only to consider the growth of the motor coach manufacturing industry to realize that our own business would hardly have been possible if the pioneer coach makers had refused to be guided by modern merchandising practice.

Advertising has been so inseparably linked with the history of coach ride selling that little attention has been paid to any other means of merchandising, but we believe that in the next few years, personal solicitation and the telephone call, guided by a systematic prospect file system, will be advertising's greatest ally. Since most of our experience has been with motor coach advertising, rather than with the actual selling of rides, and as we believe that advertising is the life blood of the motor coach industry in its present state, we will confine this paper to that subject.

Several fundamental questions must first be solved before advertising can begin:

1. The size of the budget.
2. What mediums we shall use, and how we shall use them.
3. How we can check the results of the mediums used.

The problem of a budget, its size and disposition is the chief worry of any advertiser. Mitten Management has separated its intercity motor coach business from its city business by the incorporation of two subsidiaries of the Philadelphia Rapid Transit Company. The Philadelphia Rural Transit Company operates the city lines, using double and single-deck, gas-electric motor coaches. The Peoples Rapid Transit Company, known under the name of "Mitten Tours," operates in interstate travel only between Philadelphia and Atlantic City, New York, Washington, Wilmington, Doylestown and Easton, with summer tours to Niagara Falls and Quebec. "Mitten Tours" uses only de luxe, single-deck, gas-electric coaches.

In Philadelphia, most of our motor coach advertising efforts are confined to "Mitten Tours," as this type of business best lends itself to merchandising. We base our "Mitten Tours" advertising budget on anticipated gross receipts, which has proved to be quite satisfactory. Our estimated gross for 1928 is $762,000 and our advertising budget calls for 3.9 per cent of this amount, or $30,000. We break this down as follows:

1.	Newspaper advertising	$14,000
2.	Folders and literature	4,500
3.	Signs in street cars	4,000
4.	Magazines and telephone books	3,500
5.	Billboards	600
6.	Window displays	400
7.	Miscellaneous	3,000
	Total	$30,000

* From an address before the Bus Division of the American Automobile Association at Cincinnati, Ohio, on June 28.

Although we concentrate on the six above named mediums, we occasionally experiment in new fields, where we think a special appeal is needed, such as radio, movies, exhibits, etc.

Newspaper Advertising

The largest percentage of our appropriation has been expended on newspaper advertising. Here no effort is made to tell the story of the joys of "motorcoaching," or the efficiency of the gas-electric, but rather to furnish a constant reminder and a ready reference for those who desire to go from one place to another. Out of our appropriation of $30,000 this year, we have allowed $14,000 for newspaper advertising. Of this latter amount, we have set aside $550 for type composition, drawings and engraving, allowing $13,450 for space, which is divided into monthly allotments of $1,100, with $1,000 in the summer months. Statistics show that the circulation of Philadelphia newspapers is slightly increased during the winter months, so we spend the greater part of our appropriation in this period. We concentrate during the spring and summer months on our other mediums.

In Philadelphia, we have six daily newspapers representing a combined circulation of nearly a million and a half. The combined cost is about $2.40 a line per day, or 40 cents a line per paper per day, or $5.60 per paper per day per column inch. Each paper is given an equal amount of advertising a year, scheduled so that there is an ad in one or more papers each day. We find it necessary to advertise in all towns in which we stop. Those who have had any experience with space buying in the newspapers know that $14,000, to cover all the cities on the routes mentioned, including Philadelphia, New York, Washington and Baltimore, must be spread very thin.

Casting about for the very best way to spend our $14,000, knowing at the same time that we could not attempt to buy large ads with beautiful illustrations and clever sales talk, we decided to confine ourselves to frequent, small insertions, attempting to have the ads placed under such headings as "motor coach section," amusement section, or the sport page.

The motor coach riding public wants to know the following facts about your service:

1. Destination.
2. Price one way, and price round trip.
3. Name of the company, address and telephone number.
4. The schedule.

Feeling that destination and price were of the greatest importance, we set this matter in heavy black type. By careful planning a space only one column wide by 14 lines, or one inch, in height, was found necessary for the city papers. In the small town papers, where the cost per line was not so high, we found that we could afford to buy a 52-line ad 2 columns wide by 2 in. high. Many of the towns only had weekly papers which solved the problem of how many insertions per week.

In the opening of new routes, we use larger copy and considerably more art work. We believe in good drawings or photographs where space permits and have been using a photo of our coach in some of the 52 line ads. As for the small ones it would take a shoe horn to get another line of type into the 14 line space, yet the type has been so advantageously placed that there is no appearance of crowding.

Distribution of Folders

We are fortunate in the Philadelphia Rapid Transit Company to have at our disposal 40,000 metal boxes or racks for holding folders. These racks are screwed to the backs of all seats in the trolley cars, elevated trains, motor coaches and on our subway-elevated platforms. In the case of the coaches, boxes are not fastened to the seats, but to the wall between the seats, directly under the window. We doubt if there is a more comprehensive method of distributing folders. Several weeks ago we distributed 250,000 four-page folders, advertising our summer tours, in about three and one-half days, by placing six or more folders in each box.

Folders for this distribution are 3-⅞ in. by 7-½ in., two or four pages, printed in one color ink. An attractive art head with an interesting title is employed to induce the rider to take the folder from the box. For a folder of more lasting value, we use the conventional highway colored tourist folder. We take exception to two of the standard practices today in folder making, the use of crowded text matter and the use of small photographs. Folders should be laid out with all the skill of a good typographer. No typographer will crowd his pages. We allow lots of white space. Drawings are used in our folders instead of photographs. because no scenic photograph is worth while unless it is 8 in. by 10 in. in size, or over, and because good interesting photographs are so hard to get. A good artist's sketch of a building or a scene adds a dignity to copy that cannot be obtained by a photograph.

We were "hard put" to know how to publish our high grade folder so that we could cover both summer and winter business, until we hit upon a scheme of preparing a basic eight-page folder containing our permanent tours, and printing a four-page insert containing our summer tours and schedules, stitching this insert in as many basic copies as we think we will need during the summer months. Our chartered motor coach business is a distinct activity and is treated in a separate folder, as we feel that regular touring business and chartered business are two distinct subjects. We also distribute our folders by placing them in waiting rooms, on our agency counters and racks and in hotels, and sending them out as direct mail enclosures.

Poster Advertising

On the front of our street cars, on the sides of our motor coaches and on our elevated stations, we have installed metal frames to hold a card 25-½ in. by 28 in. We consider these signs our best advertising medium for carrying a short message to the public. Visualize 4,000 signs on white cardboard printed in red, blue, green, or brown ink, moving up and down the streets of a city all hours of the day and night for a whole week. The signs are of 12-ply cardboard, printed in waterproof ink. The size of the frame and the distance from which the cards must be read limit the wording. If we use all the frames on the system the cost of printing these signs is from $300 to $500. This also covers the cost of installation.

There are two racks within the cars for signs, one in the bulkhead and one hanging from the ceiling. Our coaches contain a rack in the bulkhead at the front for a card 6-½ in. by 28 in. We spend about $4,000 a year on these cards with excellent results. As this space is our own, we pay no rental for the racks.

Outdoor Advertising

We have had a somewhat varied experience with outdoor advertising. Given a fine location and excellent, well painted copy, a billboard can be of great value to the operator, but to buy a number of boards in an attempt to cover the city, disregarding the all important factor of location, is like trying to "keep up with the Jones's." We have found that outdoor advertising is a good medium to supplement such other mediums as newspaper advertising and folders, but we would never think of letting it carry the whole bag. If you are desirous of converting automobile owners and riders to motor coach riders, we cannot think of any better way of reaching them than through outdoor copy. We are now laying plans for a number of small boards, the 4 ft. by 6 ft. variety, along a well-traveled motor coach route. Once or twice a year we use 50 or 60 24-sheet paper billboards.

Window Displays

We are firm believers in the value of window display and our art department spends much of its time in developing attractive signs for our waiting room windows as well as the windows of our ticket agents. Wooden frames have been built to hold cardboard posters 25-½ in. by 28 in., varnished with a mahogany stain. Attractive show cards can be inserted in this frame and the copy changed at frequent intervals. We try to develop some good local copy for a particular ticket agent, and when it is completed we send it to him by motor coach. The card and frame are sent together, the card already inserted. He keeps this sign in his window for several weeks while we are developing a new one for him. He then sends it back by motor coach in exchange for a new poster and frame. We find that this is an excellent good will builder among our agents, and it is about the cheapest form of publicity that we have been able to develop.

While experimenting with a window card idea, we hit upon a novel way to make an inexpensive imitation stained glass window. We built a wooden box 25 in. by 25 in., wired for two electric lights. A "cutall" saw, a new type of electrically driven jigsaw, was purchased, and the design for our window sign was laid out on heavy "compo" board. By means of the saw a pattern can be cut in the cardboard and colored paper pasted back of the holes. We obtain a startling effect, which proved to be a real attention arrester.

A New "Good Will" Builder

This year has seen the development of a good will builder which, although still in the experimental state, has prospects of generating a lot of new business for us. Within a radius of 50 miles of Philadelphia there is a potential population of over 5,000,000. Many of these people come to Philadelphia at frequent intervals to shop, visit or attend some amusement or sport. In an effort to tap this potential business, we are now experimenting with a miniature house organ, "Philly-bound," mailed weekly to a selected list, free of charge. The aim of this organ is to interest out-of-towners in Philadelphia, by giving them a weekly review of the

best show in town, a calendar of theatrical events and movies, a series of suggestions on what to visit, such as the art galleries, historical shrines, exhibits, picnics, conventions, parades, and sports, and a page of advertising matter for Mitten Management and its subsidiaries, written in light vein. The cost of this pamphlet, which is approximately four cents per person per week, is carried jointly by the street railway company, the motor coach companies, the taxicab company and the bank, as all the units profit. Every time we mention a sports event, show or exhibit, we give full directions as to how to get there by motor coach, street car or taxicab.

We have found this little medium of value in selling motor coach tours and expect to use it to good advantage this summer. A list of subscribers has been developed by sending them their first issue and a small application card which contains a question, "What means of transportation do you use in coming to Philadelphia?" and also a blank for questions that they may desire to ask us. Through this medium we have sold trolley guides, chartered motor coach service, tours and bank stock, and have generated a flood of questions which sometimes stretch our resources to answer. After 17 issues, we have a list of nearly 2,000 subscribers who have requested that we continue sending them a copy each week.

Following Up the Advertising

Motor coach merchandising has developed very rapidly this year under the direction of the "new-business" department. Working in conjunction with our advertising efforts, this department has followed up the leads, which advertising has secured, by personal solicitation, telephone calls and direct mail. So far, the greatest effort has been in the chartered motor coach field, but gradually the organization is spreading to include "Mitten Tours" intercity service. We already have men available for conventions. Booths are installed in the convention headquarters and an information man, equipped with a knowledge of our system and a good supply of all types of literature, is always on duty.

Development of Prospect List

Part of the duty of the "new-business" department is to develop a prospect file. An effort is made to obtain the names of people purchasing tickets, as well as those who make inquiries by mail. Every person taking our Niagara Falls tour last year is a prospect for our Montreal-Quebec tour this year, which is now being solicited through this channel.

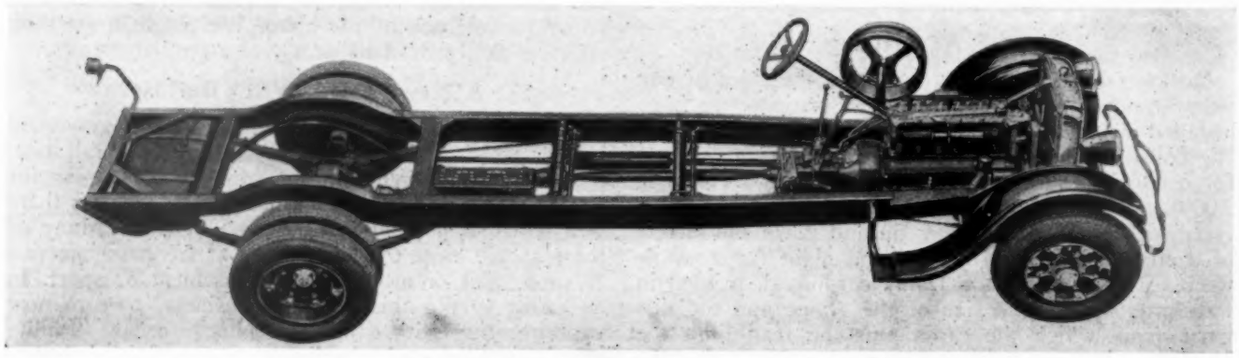
Contact with our ticket agencies is maintained through the new business department. One man is kept busy supplying agencies with literature and calling on them at frequent intervals to "rip" them up, to hear their complaints, as well as their commendations, and to watch the effect of the advertising in that locality.

We try to key our ads, such as "Write for Booklet A," "Write for Booklet B." Although the response does not accurately measure the complete effectiveness of the ad, for many would read, decide to ride and never write to us, it does give us a relative measure, which, when compared with other results, shows us the selling ability of that particular ad. It is an excellent thing never to announce a new service, a new price or a new schedule until you are ready to advertise it. After your first ad appears, check your telephone calls, personal calls and letters. Several companies are using reservation blanks attached to their folders today, a plan with which we are in hearty sympathy, although we have not done a lot of it ourselves.

Many of us are still back in this first stage of advertising. We refuse to believe that the public looks on our industry in any other light than as an experiment. Our adverti ing should now tend toward establishing the motor coach as a proven means of long distance travel. We must encourage coach advertising on the part of responsible motor coach companies. We must advocate the use of clean, truthful copy, carefully and attractively prepared. We must continue our experiments with every type of advertising medium, collecting data on results and checking these results by keying the advertising. We must supplement our advertising with sound systematic merchandising. We must sell motor coach rides in the same manner that the automobiles have built up the sale of their products. If we refuse to use these principles of selling, we cannot hope to live.

Heavy Duty Chassis for Fast Commercial Hauling

A NEW fast delivery chassis to provide express service for heavy freight loads has been developed by The Studebaker Corporation of America, South Bend, Ind. This chassis is offered in three types as follows: the Model 75 Junior, 158 in. wheelbase, weighing 4,400 lb., which allows for a body and load weight of 7,600 lb.; the Model 76 special, 184 in. wheelbase, weighing 4,860 lb., which allows for a



One of the Studebaker Heavy-duty Chassis for Fast Commercial Hauling

body and load weight of 7,640 lb. and the Model 75 heavy duty, 184 in. wheelbase, weighing 5,400 lb., which allows for a body and load weight of 8,600 lb.

The Studebaker Model 75 motor used in these chassis has been refined to a point where it now delivers in excess of 90 hp. These chassis will carry loads up to 2½ and 3½ tons at speeds up to 25 to 55 miles an hour.

The use of pneumatic tires will permit operation on national highways in almost all states. The quick acceleration and high all-around performance of the new chassis will, it is anticipated, give an increase of 30 per cent in movement of local freight in crowded cities. These chassis are equipped with malleable spoke wheels. On all chassis single or dual rear wheel equipment is optional. The frames on all three jobs are made of 8-in. pressed steel channel, securely braced with cross members. There are nine cross members on the 184-in. chassis and eight on the 158-in. chassis. This unusual bracing provides great rigidity and helps to eliminate the possibility of frame distortion.

In each chassis the motor and transmission are carried in unit in a special sub-frame which protects the entire power plant from undue strain. On all three chassis, a 3-in. propeller shaft of steel tubing is used. It is a two-piece shaft equipped with three extra large universals, the center universal being supported by a self-aligning double-row ball bearing. A ventilated disc parking brake 14 in. in diameter is mounted on the propeller shaft directly behind the transmission and operated by a hand lever.

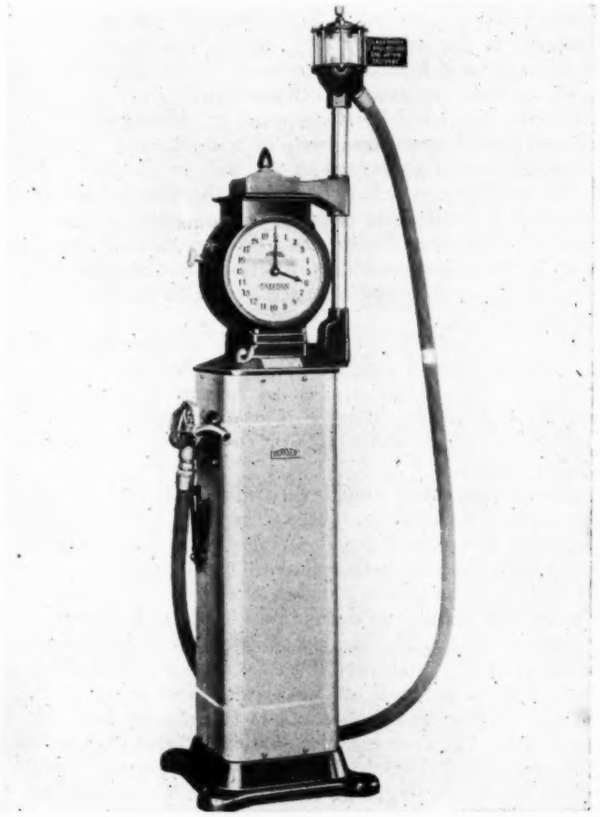
The rear axle is specially designed for high-speed, heavy-duty work. The housings are malleable iron, shaped to provide great truss strength. The load is carried on oversized bearings at the wheel hubs and differential. A sturdy backing screw keeps the ring gear in full mesh with pinion gear, preventing any tendency of "climbing" under heavy load. Heavy rubber bumper blocks attached at the spring pads serve as an auxiliary to the long, heavy springs.

Four-wheel, mechanical, amplified-action brakes, which utilize the speed of the vehicle to increase the braking action are standard on all chassis. These brakes operate with unusually light pedal pressure.

Tire and spring equipment suitable to load-carrying requirements will be supplied. In the dual wheel equipment, there is ample space between the wheels for chains. The front tread on the Model 75 chassis is 61 in., and 57 in. on the models 76 and 75 Junior, providing an unusually short turning radius.

Bowser Announces New Gasoline Pump Line

THE new "Xacto Sentry Line" recently placed on the market by S. F. Bowser & Co., Fort Wayne, Ind., is designed for fast and economical motor coach fueling. It can be obtained in four models: The hand operated, with a piston-type pump; the air operated, with an auxiliary tank; the remote control, operated electrically; and the air operated, having direct pressure on the storage tank.



One of the Bowser Models

All of these models are designed to give rapid dis-

* * * *

Northern Ohio Power & Light Co., Houses Its Twin Motor Coaches in Car Barns

charge, accurate measurement, accurate record of fuel supplied, and nozzle control.

The rate of discharge is 18 to 20 gal. a minute, permitting the filling of the tank of the average motor coach in from three to five minutes. Developed from the Bowser "Xacto Meter", an accurate measuring device, the new sentry line provides an accurate record of the gasoline discharged. Two large dials, which are plainly visible, show the exact amount of gasoline pumped out at any time. The large hand on the dial travels around it once for each gallon discharged and a bell rings after the completion of the pumping of each gallon. When each gallon is discharged, the small hand advances to the next number, giving a complete record of the transaction. The mechanism that operates the hands is synchronized with the measuring unit and cannot be manipulated by the operator. When the transaction is completed, one turn of the set-back knob returns the hands to zero.

The totalizer, which is built into the face of the dial, provides a method of accounting for each gallon dispensed. This provides a check at the end of the day against the records of the drivers as to the total number of gallons of gasoline furnished their coaches during the period.

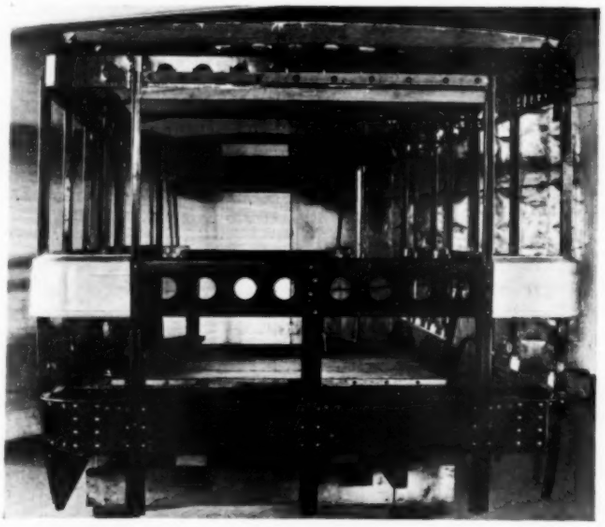
The three power-operated models are equipped with the nozzle control feature. This enables the attendant to deliver the correct amount of fuel to the tank of the motor coach without danger of an overflow. The nozzle can be locked inside the housing to prevent unauthorized withdrawals.

The air-operated model with auxiliary tank operates by exerting pressure on a 60-gal. container. The gasoline is forced through the measuring unit by air pressure, and an air release is installed in the line which expels all air which might be carried along with the gasoline. The remote control model is operated by a motor-driven rotary power pump, which can be located either inside or outside. A make-and-break switch, actuated by a lever that is part of the hose hook and is located on the side of the housing, controls the motor that drives the pump. The flow is controlled by a pistol-type nozzle. The air-operated model, where the air pressure is applied directly on the large storage tank, is equipped with the necessary safety devices to prevent excess pressure being applied on the tank.

The hand-operated, air-operated and remote controlled, electrically operated models are approved by the Underwriters' Laboratories for outside installation, and the latter two models are also approved by the Underwriters' Laboratories for inside installation. The hand-operating unit is equipped with a double-acting, piston-type pumping unit with which gasoline is discharged on both strokes of the pump.

All-Metal Motor Coach Body

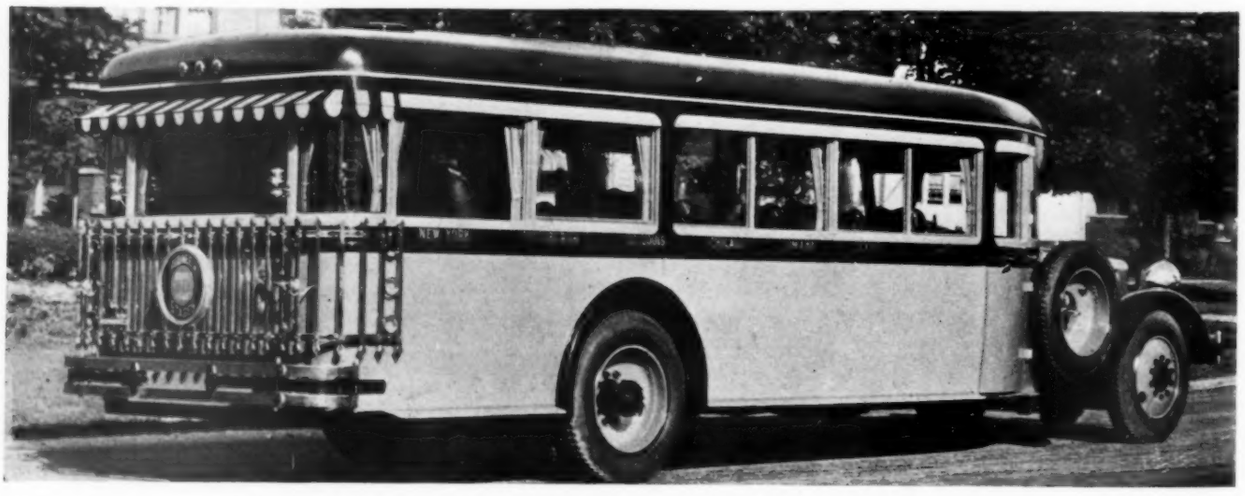
THE Lang Body Company, Cleveland, Ohio, has placed on the market, after three years of engineering and manufacturing investigation and testing, an all-metal motor coach body, consisting of a steel frame structure, aluminum panels and aluminum castings throughout. This combination of metals provides for strength and light weight.



The Rear End of an All-Metal Body, Showing the Frame Construction

In addition to the feature of light weight, there is the accessibility for servicing damaged panels, since the frame of the body forms the entire structural strength. The panels are applied by Lang's special moulding which is removed from the interior, allowing the panel to slip off and a new finished panel to be applied.

The interior baggage compartment is designed to provide full head room to the entrance door. The exterior rear trunk compartment is 62 in. in depth and



A Transcontinental Motor Coach Provided with a Lang All-Metal Body

the full width of the body. This arrangement allows ample room for hauling baggage in the interior and exterior of the coach.

The bodies are so constructed that if an operator desires the conventional type of roof with an exterior baggage rack, it can be easily built without any interruption of production.

A Communication

Boston & Maine Carries Liability Insurance

BOSTON, MASS.

TO THE EDITOR:

We carry liability insurance for the amount of $50,000 for one person, and $100,000 in one accident, together with $5,000 for property damage. The cost of this insurance is based on a percentage of passenger revenue, and while payment is made only once in three months, the amount is set up monthly.

All states through which we operate have some form of bond or insurance policy that has to be filed before a coach can be operated on an intrastate basis through the state, but in many cases it is based on the registration. Consequently any coach, whether operating intrastate or interstate, has to have the same protection. New Hampshire requires a bond or a liability policy in the amount of $500 for each coach and $100 additional for each passenger. Vermont requires insurance or bond in the amount of $5,000 for one person, $10,000 for one accident and $1,000 for property damage. Maine requires insurance in the amount of $500 each passenger; minimum $5,000, maximum $10,000 for any coach seating less than sixteen passengers; and for coaches seating over sixteen passengers, $10,000 minimum, and $20,000 maximum; with $1,000 property damage in either case. New York requires $2,500 for one person, $5,000 for one accident, and $1,000 for property damage. Massachusetts requires $500 bond and insurance in the amount of $5,000 for one person and $20,000 for one accident; or a bond of $20,000 on the first vehicle, $10,000 additional on each vehicle of the next four, and $2,500 additional for any above that. No provision is made in Massachusetts for property damage. They also have a maximum bond for police of $100,000.

With the present rate that we have, we feel that it is the best practice for us to continue on an insurance basis and not try to handle our own claims from accidents. If it were necessary for us to handle them, it would require the establishment of another separate department, and we do not feel this would be justified under the present rate of insurance which we are paying.

R. J. LITTLEFIELD,
Manager, Motor Coach Service,
Boston & Maine Transportation Company

PRIVATELY CONSTRUCTED AND FINANCED AUTOMOBILE SPEEDWAYS between the principal cities of Great Britain are proposed by a new company, recently incorporated in England and known as the Motor Roads Development Syndicate, Inc. The first routes projected are between London and Brighton and between Birmingham and Liverpool. On these proposed highways, which are planned to pass over all intervening roads and to be protected by high wire fences, motorists would be able to travel 60 miles per hour. Plans also call for a 40-foot concrete road with 157 bridges on the London to Brighton route. Tolls proposed for this latter are about 60 cents for automobiles, with increased charges for motor coaches. Six junctions would enable traffic to enter or leave the speedway, but no vehicles would be allowed to cross the road. A bill will be introduced into Parliament to grant the new company the necessary powers and if authorized the project is expected to be completed by 1930.

Motor Transport News

THE MID-WEST MOTOR TRUCK TRANSPORTATION CONGRESS will be held at Auburn, Ind., on October 23-26.

JAMES R. CLARK, formerly supervisor of orders of the Illinois Commerce Commission, has been appointed a member of the commission, to succeed David H. Jackson, whose term has expired.

THE WESTERN SLOPE MOTORWAY, INC., a subsidiary of the Denver & Rio Grande Western, has applied to the Colorado Public Utilities Commission for permission to operate a passenger and freight service with motor coaches and trucks between Grand Junction, Colo., Fruita and Mack. The highway service is proposed to replace electric railway service operated by the Grand River Valley between these points.

THROUGH MOTOR COACH service between New York and Los Angeles, Cal., has been been established by the Pioneer Yelloway System. On the first trip, passengers were carried through in 5 days and 14 hours. The line follows the Lincoln Highway from New York to Pittsburgh, the National Trail from Pittsburgh to St. Louis, the United States Highway from St. Louis to Denver, and the Santa Fe Trail from Denver to Los Angeles.

THE NORTHLAND TRANSPORTATION COMPANY, according to C. E. Wickman, president, is placing additional heaters in approximately 100 of its motor coaches to assure the comfort of its passengers during the winter season. The present heating equipment is located in the front of the motor coaches, and the additional heaters will be placed in the rear. The Northland uses Tropic Aire heaters of the hot-water type, which are manufactured by the C. H. Will Company, Minneapolis, Minn.

THE REGULATION of interstate motor coach traffic in the absence of federal laws governing such operations was discussed at a meeting of railroad commissioners and motor coach operators of seven southwestern states, which was held at Amarillo, Texas, on September 6. The meeting was called by the Texas Railroad Commission and was attended by representatives from the states of Oklahoma, Arkansas, New Mexico, Colorado, Arizona and Louisiana, as well as Texas. It was planned to initiate a program of federal motor coach regulatory legislation at the meeting.

To Abandon Line, Southern Will Provide Truck Service

The Interstate Commerce Commission, in granting the application of the Southern to abandon its Morristown-Corryton branch, 40 miles, in Tennessee, takes cognizance of the offer of the railroad to provide motor truck service for freight at regular railroad rates for a few months succeeding the abandonment of rail service. Accordingly, the certificate permitting abandonment is issued on the commission's reliance that such motor truck service will be provided until December 31, 1928.

Motor Transport Division to Meet in Detroit

The Motor Transport Division of the American Railway Association will hold its next meeting at the Book-Cadillac Hotel, Detroit, Mich., on October 24-26. Meetings will be held in the Crystal Ballroom of the Hotel. In accordance with the precedent set at the Atlantic City meeting in June, the session on the first two days will be restricted to duly accredited railroad representatives. On the third day, however, i.e., October 26, there will be an open meeting to which manufacturers and other interested persons outside the railroad field will be invited. The open meeting will convene at 2 p. m. on that date.

L. M. S. Expands Trucking Operations

Since the granting of highway powers to British railways, the London, Midland & Scottish has greatly expanded its collection and delivery service by motor truck in rural areas. Decentralized collection and delivery from each station has been supplanted by a plan whereby the work is concentrated at one station in each of several selected groups. More than 200 such trucking centers have been established and more are being added. In North Wales, where the plan is considered particularly adaptable, the territory has been divided into 14 radial distributing areas with centers from which collection and delivery services are available to each village. Storage facilities from which delivery can be arranged as desired are provided at concentration points.

Sleeping Motor Coach in England

A motor coach, equipped with sleeping facilities for the accommodation of 12 passengers, was recently placed in service in England on overnight runs between London and Liverpool.

The sleeping accommodations are provided in six lower and six upper berths with the coach divided into three compartments, each containing four berths. The two forward compartments are each six feet three inches in length while the rear one is six and one half feet. The interior height of the coach is eight feet, and its width seven feet, the latter giving a three-foot aisle between the berths which are two feet wide.

Wide World

Interior View of Two Forward Compartments Showing Also Entrance to Steward's Quarters

Each berth is equipped with an electric reading lamp and provided with a sliding window for ventilation. In addition, each of the compartments is equipped with a roof ventilator. Double curtains are hung along each berth while a heavy curtain sets off each compartment. Above each berth are racks for light articles and, in addition, four suit cases may be placed under each lower berth.

On one side of the coach's forward end is the steward's room while on the other are toilet facilities, these two rooms being divided from the sleeping quarters by a wooden door. The steward's room is equipped for cooking the light breakfast which is served to passengers free of charge.

The journey is made in about 10 hours with the coach now operating from London to Liverpool, on Sundays, Tuesdays and Thursdays and from Liverpool to London, on Mondays, Wednesdays and Fridays. The fare for the one way trip is equivalent to $6.08 as against the ordinary third class railway fare without sleeping accommodations of about $6.00.

Orders for Equipment

THE RICHMOND, FREDERICKSBURG & POTOMAC has taken delivery of a Mack 6-cylinder, 29-passenger motor coach.

THE NEW ENGLAND TRANSPORTATION COMPANY has purchased one 29-passenger parlor-observation coach from the American Car & Foundry Motors Company.

THE SOUTHERN PACIFIC MOTOR TRANSPORT COMPANY has purchased one 27-passenger parlor coach from the American Car & Foundry Motors Company.

THE FORT DODGE, DES MOINES & SOUTHERN has ordered three type Y Yellow parlor coaches from the General Motors Truck Company, Pontiac, Mich.

THE WATERLOO, CEDAR FALLS & NORTHERN has ordered three Yellow Type W parlor coaches from the General Motors Truck Company, Pontiac, Mich.

THE SOUTHERN PACIFIC MOTOR TRANSPORT COMPANY, subsidiary of the Southern Pacific, has ordered three Type Y and one Type X Yellow parlor coaches from the General Motors Truck Company, Pontiac, Mich.

THE LACROSSE & SOUTHEASTERN TRANSPORTATION COMPANY, subsidiary of the LaCrosse & Southeastern, has ordered three Type W Yellow coaches of the parlor type from the General Motors Truck Company, Pontiac, Mich.

THE FRASER ELECTRIC TRANSMISSION CORPORATION, Cleveland, Ohio, has bought a six-cylinder 29-passenger gas-electric motor coach from the Mack-International Motor Truck Corporation. This motor coach is to be used by the National Railway Appliance Company of New York for demonstrating throughout the country the Fraser gas-electric drive.

Motor Transport Officers

P. J. Neff, general superintendent of the Missouri Pacific, with headquarters at St. Louis, Mo., has been appointed assistant to the president, with the same headquarters. Among other duties, Mr. Neff will have special charge of motor transport and aviation developments on the Missouri Pacific.

Among the Manufacturers

Walter G. Schmunk, vice-president, treasurer and a director of the **Brown Body Corporation** for the past thirteen years has tendered his resignation to take effect at once.

R. H. Newcomb, formerly assistant to the vice-president of the New York, New Haven & Hartford, has been appointed representative in the New England territory of the **Lang Body Company**, Cleveland, Ohio. Mr. Newcomb's headquarters are in Boston, Mass.

The **Lapeer Trailer Corporation** has purchased from the Guaranty Trust Company of Detroit, receivers, the assets of the **Wolverine Trailer Company** of Detroit. Present users of Wolverine trailers will be able to secure additional trailers for their fleet or repair parts from the Lapeer Trailer Corporation, Lapeer, Michigan.